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United States Centennial Commission.

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INTERNATIONAL EXHIBITION,  
1876.

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REPORTS AND AWARDS

VOL. IV.

GROUPS III-VII.

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EDITED BY  
FRANCIS A. WALKER.  
CHIEF OF THE BUREAU OF AWARDS.

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WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1880.

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MAR 3 1883

*Gift of  
Rev. Mr. J. C. ...  
...*

## GROUP III.

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CHEMISTRY AND PHARMACY, INCLUDING THE  
APPARATUS.

iii

## GROUP III.

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### J U D G E S.

#### AMERICAN.

C. A. JOY, Columbia College, New York,  
N. Y.  
F. A. GENTH, University of Pennsylvania,  
Philadelphia, Pa.  
J. LAWRENCE SMITH, Louisville, Ky.  
C. F. CHANDLER, Columbia College, New  
York, N. Y.  
J. W. MALLET, University of Virginia, Va.

#### FOREIGN.

WILLIAM ODLING, Great Britain.  
RUDOLPH VON WAGNER, Germany.  
J. F. KUHLMANN, France.  
PROSPER DE WILDE, Belgium.  
EMANUEL PATERNO, Italy.

JAYME BATALHA REIS was temporarily assigned from Group IV. to assist in the examination of olive oil.

## GROUP III.

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### CHEMISTRY AND PHARMACY, INCLUDING THE APPARATUS.

#### CLASS 200.—CHEMICALS, PHARMACEUTICAL PREPARATIONS, ETC.

Mineral acids, and the methods of manufacture. Sulphuric, nitric, and hydrochloric acids.

The common commercial alkalies,—potash soda, and ammonia, with their carbonates.

Salt and its production. Salt manufactured from deposits. Native salt. Salt by solar evaporation from sea-water. Salt by evaporation from water of saline springs or wells. Rock salt. Ground and table salt.

Bleaching powders, chloride of lime, etc.

Chemicals and chemical compounds generally.

Pharmaceutical compounds.

#### CLASS 274.—Pharmaceutical apparatus.

#### CLASS 201.—OILS, SOAPS, CANDLES, ILLUMINATING GASES, ETC.

Oils from mineral, animal, and vegetable sources. Refined petroleum, benzine, naphtha, and other products of the manufacture. Oils from various seeds, refined, and of various degrees of purity, such as olive oil, cotton-seed oil, palm oil. Animal oils, of various kinds, in their refined state. Oils prepared for special purposes besides lighting and for food. Lubricating oils.

Soaps and detergent preparations.

Candles,—stearine, glycerine, paraffine, etc.; spermaceti.

Illuminating gas and its manufacture.

Oxygen gas, and its application for heating, lighting, metallurgy, and as a remedial agent.

Chlorine and carbonic acid.

CLASS 202.—Paints, pigments, dyes, colors, turpentine, varnishes, printing inks, writing inks, blacking.

CLASS 203.—Flavoring extracts, essences, perfumery, pomades, cosmetics.

CLASS 659.—Sugar, syrups, and sugar-making apparatus.

CLASS 508.—Chemical manufacturing machinery.

CLASS 509.—Gas machinery and apparatus.

CLASS 108.—Mineral fertilizing substances,—gypsum, phosphate of lime, marls, shells, coprolites, etc., not manufactured.

CLASS 681.—Commercial fertilizers, phosphatic, ammoniacal, calcareous, etc.

CLASS 581.—Sugar refining machines.

CLASS 582.—Confectioners' machinery.

Matches.





GENERAL REPORT  
OF THE  
JUDGES OF GROUP III.

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INTERNATIONAL EXHIBITION,  
Philadelphia, 1876.

PROF. FRANCIS A. WALKER, *Chief of Bureau of Awards:*

SIR,—I send you herewith the general report of the Judges of  
Group III.

Respectfully yours,

J. W. MALLET.



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## GROUP III.

### CHEMISTRY AND PHARMACY, INCLUDING THE APPARATUS.

#### PRODUCTION OF SUGAR.

BY J. W. MALLET.

The term sugar applies not merely to a single substance, but to a class, no longer a very small one, of substances related to each other by like chemical and physical properties. Of these, five are found in general commerce, viz., sucrose, or cane-sugar; dextrose, or grape-sugar; lævulose, or syrup-sugar; lactose, or milk-sugar; and mannite, or manna-sugar. The last two are of pharmaceutical interest only; the first three are the materials with which the manufacturer of sugar on the great scale and as an article of food has really to do.

Cane-sugar, when pure, readily forms very distinct crystals; dextrose crystallizes imperfectly and with difficulty, while lævulose will not crystallize at all, but forms a thick, viscid syrup. The first of these three is related in composition to the other two in such a way that when heated with water for a considerable time, or far more rapidly if a little acid be present, the cane-sugar unites with one-nineteenth of its weight of water and breaks up into equal quantities of dextrose and lævulose. As the mixture of these two will not crystallize by mere evaporation, the change in question is said to convert crystallizable sugar into uncrystallizable, or (in consequence of the changed relation to polarized light) the cane-sugar is said to be "inverted." Invert-sugar, or a mixture of dextrose and lævulose, thus produced forms the original and essential portion of molasses, but is mixed in it with a large amount of unaltered sucrose, which is practically prevented from crystallizing by the water which remains in the syrup. Dextrose can be artificially made by boiling starch with water containing a little acid, neutralizing the acid, and evaporating the liquid. So that in a broad way it may be said that the products of the sugar-industry are



Crystallized cane-sugar;

Invert-sugar (dextrose and lævulose) in molasses;

Dextrose made from starch,—often called starch-sugar.

But cane-sugar, obtained from the juice of various plants, occurs therein under special conditions in the several plants, and the process by which it is manufactured, while the same in general principle in all cases, requires to be modified to no small extent with the nature of the material used. It is common, therefore, to distinguish by different names the sucrose obtained from special plants, and by more or less special methods. The only varieties of any general commercial importance are

Cane-sugar (in the restricted sense, as produced from the sweet cane of the tropics);

Beet-sugar;

Maple-sugar;

Palm-sugar;

Sorghum-sugar.

When pure, all of these are cane-sugar in the chemical meaning of the term; all are one and the same substance, though derived from different sources.

In attempting to prepare a summary of what was to be learned at Philadelphia in this department of industry, it may be well to arrange the subject under the heads of

Geographical distribution;

Agricultural methods and results;

Processes of manufacture (including chemical treatment);

Machinery and mechanical appliances;

Statistics of production.

In proceeding to consider these in succession it must be premised that in this, as in most departments of the Exhibition of 1876, there was great difficulty in obtaining detailed information as to the goods displayed. No doubt mainly in consequence of the great distance from Philadelphia of most of the countries exhibiting, a very large proportion of the goods came unaccompanied by owners or their immediate representatives. Scores of different exhibits, including hundreds of articles, were often in charge of a single local agent or firm, and some of the smaller countries had but a single person in charge. It was not always easy to find the person responsible for an exhibit, his time and attention being subject to so many calls, and when found he, of course, could not be expected to have the intricate details of a number of utterly diverse manufactures at his command; so that inquiries which the goods suggested, and the answers to which would probably have proved most interesting, often had to go unanswered.

*I. GEOGRAPHICAL DISTRIBUTION OF SUGAR PRODUCTION.*

The following list of countries exhibiting any of the forms of sugar and matters connected with its manufacture, with the remarks appended as to the general character of the contributions made, will serve to show how far this industry was represented. The countries are taken in something like geographical order, beginning with eastern Asia and going westwards.

## JAPAN.

A small but interesting collection of raw sugars from cane, sent by the Imperial Department of Industry, Agriculture, and Commerce. Dark in color, and imperfectly drained, they were adapted to refiners' use; but the prices verbally quoted for them were very high, if there was no mistake on the part of the interpreter. The production of cane-sugar, doubtless in consequence of latitude, does not seem to exist upon any considerable scale in Japan. Starch-sugar is habitually made, and it will be noticed under the head of processes of manufacture.

## CHINA.

A collection, sent by the Imperial Maritime Customs, of 46 samples of cane-sugar from the ports of Foochow, Swatow, Amoy, Takow, Tamsui, and Canton, — chiefly the products of Formosa and the Kwangtung and Fukien provinces. More than half of these were refining sugars of dark color, some of them containing so much undrained molasses as to admit of their being classed with "concrete." Two or three were soft sugars of light yellow color. A few were "clayed," or washed, and had a nearly white color like that of some of the South American samples. And there were several lots of large crystals, of more or less deep yellow and brown tints,—sugar-candy, in fact,—the manufacture of which is of very long standing in China. The prices quoted ranged from \$2.20 to \$9.00 per picul, or about \$37.00 to \$151.00 per long ton.

## PHILIPPINE ISLANDS.

From this magnificent possession of Spain there came a collection, contributed by sundry exhibitors, of many small samples of raw cane-sugar, all produced by open-pan evaporation,—some of them clayed. Most of the specimens were from the province of Pampanga, in the island of Luzon, but many were from other islands, and represented in part, as in the case of a contribution from Mindanao, the efforts to

colonize the great area—much the larger part of the whole group—which still remains dangerously savage and piratical. Most of the samples were dark, moist sugars, of importance mainly on account of their low price, as material for refining. They ranged from  $2\frac{1}{2}$  to  $3\frac{1}{2}$  Spanish dollars per pico, equivalent to about \$42.00 to \$59.00 (gold) per long ton. There was one specimen of remarkably light color, moist but highly crystalline, sent by the Junta Provincial of Antique, at \$42.00 per ton. Some of the very dark-colored sugars were produced for local sale to the Indians (aborigines).

## JAVA.

A handsome collection of raw cane-sugars (including samples from Sumatra) sent by the Government of the Dutch East Indies. The greater number were soft, medium and light yellow in color, some ranking as "coffee-sugar." Also, on the part of the native Prince Mangkoe Negoro, of Soerakarta, one sample of drained form sugar and two of excellent centrifugal crystals, sharp, clean, and colorless.

## QUEENSLAND.

The gradual development of the culture of sugar-cane as an important industry in this colony was illustrated by a good series of soft sugars, some made in the vacuum, others in the open pan. The latter were remarkably good, light in color, and bright in grain. One specimen, from the St. Helena establishment, was marked as part of a lot of 10 tons, the product of  $4\frac{1}{2}$  acres of ribbon-cane, 15 months old.

## NEW SOUTH WALES.

The Colonial Sugar Company of Sydney had a series of raw and refined cane-sugars,—the centrifugal crystals of excellent quality. There were also two or three individual exhibits from the Clarence River district, latitude  $28\frac{1}{2}^{\circ}$  S., where the cane is chiefly cultivated.

## EGYPT.

Refined cane-sugar,—both loaf and centrifugal,—from the private estates of the Viceroy, representing the product of thirteen factories (with improved, modern machinery) in Upper Egypt, of the buildings of which photographs were also exhibited.

## MAURITIUS.

A collection of fifteen samples of cane-sugar; some of these were bright yellow "coffee" sugars; others were crystallized and *vesou* (crude brown).

## ANGOLA.

In the extensive collection of raw products from the Portuguese colonies were some specimens of sugar-cane and of coarse, dark sugar made from it in Angola, on the west coast of Africa; in these representing, however, merely local manufacture and consumption.

## LIBERIA.

A single lot of fair refining sugar from cane grown on the St. Paul's River was shown by Edward S. Morris & Co.

## SPAIN.

It was interesting to find amid the Spanish contributions to the Exhibition evidence that the sugar-cane still lingers on the path by which the Saracens carried it westward, to be borne on by the Spaniards to their grand American empire. There were three exhibitors of sugar made from the cane in Old Spain: one from Malaga and two from Granada. Don Juan Torrent, of the latter province, is reported as making 300,000 pounds per annum. Some of the samples were brown, others nearly white (clayed or washed), made directly from cane-juice without refining. There was one specimen of vacuum-pan centrifugal crystals. These specimens probably represent about the highest latitude of either hemisphere in which sugar can be made from the cane.

## ITALY.

From the neighborhood of Milan there was sent a single specimen of sorghum-sugar,—light yellow, soft, and of fair grain. About 1000 quintals a year are said to be made by the exhibitor, Carlo Erba.

## RUSSIA.

This country sent to the Exhibition the largest, and, in many respects, the finest display of sugar. It was altogether produced from beet-root, consisted largely of refined loaf, but included also centrifugal crystals,—partly the result of refining, partly produced directly from the juice,—with some specimens of raw sugar of the lower grades. Twenty-seven exhibitors in the governments of Plock, Warsaw, Volhynia, Podolia, Kief, Kharkoff, and Tamboff were represented; the two principal centres of these areas of production being Warsaw and Kief respectively. Where the general character of the exhibits was so good it was not easy to single out the best, but the loaf-sugar of Richard Kümens (Sobolefsky sugar-mill), of Podolia, of the Josefow Sugar-Manufacturing Company, and Hermanow Sugar-Manufacturing Company, both of Warsaw, of the Kief Sugar Refinery, and

of Frederick Keschner (refiner), of St. Petersburg, were especially worthy of mention. The miniature loaves made by the last named for export to Persia, where, it is said, they are likely to figure in the list of presents on formal occasions, furnished a glimpse of a special line of far-distant commerce. Among the finest centrifugal sugars produced directly from beet-juice were those of Prince Victor Wassiltschikoff, Tarnoffski, and the Dschurin Sugar Manufacturing Company, of the government of Podolia. From this last establishment a jar of the crystallized "mass" ready to be placed in the centrifugal machine, and yielding 75 to 80 per cent. of marketable crystals, gave a good idea of the completeness with which decolorization had been carried out. Sugar-candy was shown by one Moscow firm, but apparently only as a sweetmeat, and there was a little starch glucose. Fully refined loaf-sugar is reported to be worth on an average 7 rubles per pud, equivalent to about \$335.00 per long ton. Raw (brown) sugar, 5 rubles per pud, or about \$239.00 per long ton.

#### GERMANY.

The beet-sugar of Germany was not to be found in the Exhibition. Good grape- (starch-) sugar was sent by Alex. Schörke, of Görlitz.

#### NETHERLANDS.

From the Arnheim Beet-Sugar Factory came centrifugal crystals, showing by polarization up to 99.6 per cent. pure sugar, made directly from the beet-juice; also light brown crude sugar.\* Two firms exhibited starch-sugar,—solid, and syrupy,—as well as caramel prepared therefrom for coloring purposes. The thick, and very bright and clear, syrupy glucose of Van Tilvoorde, was particularly noticeable. One of these firms manufactures to the extent of 300,000, and the other 400,000 kilos. per annum, the chief demand for their products being from brewers.

#### BELGIUM.

Demeulemeester, of Ghent, had sugar-candy of four qualities, illustrating a manufacture to the extent of 10,000 fr. per month, most of the product going to the makers of champagne and other sparkling wines.

#### FRANCE.

Two important firms were represented, that of É. Menier, whose name is best known in connection with chocolate, but who manufac-

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\* It seems undesirable to refer to this and similar sugars as "muscovado," since this term is used with some uncertainty of meaning; sometimes as applying to any soft, moist brown sugar, and sometimes, particularly in the Spanish West Indies, as referring to the product of a second boiling of molasses only.



tures 3,500,000 kilos. of beet-root sugar a year at Roye (Somme) and sent some first-class centrifugal crystals of various sizes of grain; and that of Constant Say, of Paris, who refines only, but to the great extent of 80,000,000 kilos. per annum, and from whose establishment there came a very handsome exhibit of loaf-sugar of large and fine grain. Syrupy glucose and caramel, both from potato-starch, were also shown by Antheaume & Fils, of Bourget, near Paris.

#### CANADA.

One or two small exhibits of maple-sugar were sent in cakes and sharply crystalline lumps.

#### UNITED STATES.

Louisiana cane-sugar was not exhibited. There were two small lots of beet-sugar; one from Freeport, Illinois, including refined loaf, colorless centrifugal (first product), and soft yellow (second product); the other from Soquel, Santa Cruz County, California, in centrifugal crystals. Maple-sugar was to be found in small samples from New Hampshire, Vermont, Michigan, and Ohio. It was in the usual form of small cakes, more or less well drained, and in most cases presenting distinctly the special maple taste, which gives it value as a luxury. There was one exhibitor of fine starch-sugar, solid and syrupy.

#### MEXICO.

Nine or ten exhibits of cane-sugar, most of it in clayed loaves or forms, a little refined, and one quite good sample of light yellow soft sugar, produced directly from the cane by simple open-pan boiling. Most of the exhibits were from Morelos.

#### CUBA.

This island, standing at the head of the list of sugar-producing countries of the world, though not proportionately well represented, furnished a valuable series of specimens of the product of the cane, among the most interesting of which were the white centrifugal crystals from the Las Cañas estate of Don Juan Poey, almost equaling the best products of the refiner, but obtained on the spot directly from the juice of the cane with the use of animal charcoal, the vacuum-pan, etc. White sugars also were well worthy of notice, made with the aid of animal charcoal, but by open-pan evaporation. There were also good specimens of soft, yellow centrifugal sugars, and of muscovadoes, from second boiling of molasses.

## PORTO RICO.

Several samples of soft refining cane-sugar, and one of crystallized centrifugal.

## GUADELOUPE.

Three specimens of centrifugal crystals, made directly from the cane.

## JAMAICA.

Small samples of soft, yellow cane-sugar, from nine of the estates of the island, accompanied by a much fuller and better illustration of the rum mad from molasses. One of the best specimens was bright, clear, open-pan sugar from the Bog Estate.

## TRINIDAD.

The Colonial Company (limited) sent white sugar crystals, cane of course, of good quality, from the Sainte Madeleine usine.

## VENEZUELA.

The collective exhibit from this country included a few samples, in poor condition, of cane form sugar, clayed.

## BRITISH GUIANA.

There was an excellent series of cane-sugars from this colony,—all well deserving notice,—but of which perhaps the most remarkable were vacuum-pan centrifugal sugar, from the plantation La Bonne Intention, and open-pan sugar from the plantation Leonora,—both obtained by the maceration process.

## BRAZIL.

Amid the full and interesting display of the resources of the empire, cane-sugar was not omitted. Some thirty exhibitors sent specimens of all the varieties usually made,—soft, raw, brown sugar; vacuum-pan centrifugal crystals; a very little refined loaf; and especially the clayed (cassonado) form sugar from open-pan evaporation, which is produced upon a very large scale. There were some good samples of light-colored muscovado from second boiling. Among the best products shown were those of the Visconde de Maua, the Commendador José Ribeiro de Castro & Son, and Mansell, Carré, & Co., all of Rio; José F. Pires Portella, of Pernambuco; and Alfonço Mangin Desincourt, of Maranhao. There were one or two small samples of sugar-candy.

## · ARGENTINE REPUBLIC.

There were a few large forms of clayed crude cane-sugar from open-pan boiling; the crystallization fairly good, but in color and drainage not equal to the specimens from Brazil. From Buenos Ayres came a small lot of excellent animal charcoal, one of the most important materials used by the sugar-refiner.

## PERU.

A few samples of white form and centrifugal cane-sugar of fair quality, from Solf & Co., of Lima.

## HAWAIIAN ISLANDS.

There was a very good suite of the sugars from Sandwich-Island cane, which, for the most part, find their way to the United States. They came from the islands of Hawaii, Maui, and Kauai, and were of three classes,—fine, white, vacuum-pan, centrifugal sugar (washed), made directly from cane-juice; soft, light yellow coffee-sugar; and open-pan (sorghum-pan) sugar of dark color for refiners' use. The production of the higher grades has been steadily declining and is now exceptional. For ten years past something like four-fifths of the product of the islands has been coffee-sugar; now as large a proportion is dark sugar for San Francisco refineries.

In looking over the above list it will be seen that the following, among the more important remaining regions of sugar-production, were not represented: for cane-sugar; British India, Siam, Cochin China, Reunion, South Africa, Louisiana, San Domingo (where already in 1518 there were twenty-eight Spanish sugar-mills), and sundry of the smaller West Indian islands, as Barbadoes, Antigua, Martinique, etc., French Guiana, and the Dutch colony of Surinam: for beet-root sugar; Germany, Austria-Hungary, and Belgium,—the second, third, and fifth countries in order of present production. Sweden, moreover, has several beet-sugar factories; England one; in Denmark one has lately commenced work, and Italy had and probably still has one or two in the northern part of the kingdom. California has two others beside the one exhibiting.

Of cane-sugar from the less extensively employed plants: there was no palm-sugar from India, Java, or Northern Africa,—very little of this finding its way into general commerce, most of it being prepared in a comparatively small way and locally consumed. Sorghum-sugar, or syrup, no doubt continues to be made in several countries beside

the single one sending a specimen, but not to any very great extent, and the culture of the plant is probably decreasing. Maple-sugar scarcely ranks among the great staple productions of the countries affording it. More or less, however, is made in most of the northern and several of the middle States of the Union, as far south even as North Carolina and Tennessee. There was no specimen exhibited of the melon-sugar, the manufacture of which is said to have been lately begun on the coast of California, about seventy miles from San Francisco, with good promise of success.

## II. AGRICULTURAL METHODS AND RESULTS.

Under this head but little could be learned, in consequence of the absence—in any official connection with the various exhibits—of persons practically familiar with sugar cultivation as carried on in the respective countries. The following notes, however, have been collected :

### SUGAR-CANE.

It has long been known that in over-ripe cane, when either decay or renewed growth sets in, cane-sugar becomes “inverted,” or changed into dextrose and lævulose, rendering it incapable of crystallization. In India, at Aska, in the Madras Presidency, experiments of L. Kollmann\* have shown very clearly that in unripe cane uncrystallizable sugar also occurs,† and in large amount, as the following table, abridged from his paper, illustrates :

DATE.	PERCENTAGE OF SOLID MATTER IN JUICE.	PERCENTAGE COMPOSITION OF SOLID MATTER OF JUICE.		
		CANE-SUGAR.	UNCRYSTALLIZABLE SUGAR.	OTHER SUBSTANCES (NOT SUGAR).
November 27.....	12.88	72.36	22.90	4.74
December 6.....	15.79	81.69	14.70	3.61
“ 18.....	15.39	81.48	15.26	3.26
“ 24.....	15.20	84.07	11.71	4.22
January 7.....	18.04	93.68	3.77	2.55
“ 16.....	19.04	94.69	2.47	2.84
“ 22.....	19.66	96.13	1.84	2.03
“ 29.....	19.39	97.52	.....	2.48
March 31.....	18.42	93.11	4.02	2.87

Hence the advantage of producing for the mill cane as thoroughly

\* “*Das Zuckerrohr und seine Verarbeitung mittelst des Diffusions-Processes in Louisiana*,” in *Zeitschrift des Vereins für Rübensuckerindustrie in Oesterreich-Ungarn*, 1875, S. 277.

† Icery, several years ago, pointed out the development of invert- into cane-sugar during the growth of the upper part of the stem under the influence of light.—*Ann. Ch. Phys.* [4], v. 350.

ripened as possible is seen to involve not only absolute increase of sucrose, but rapid gain upon the invert-sugar which forms molasses and prevents the crystallization of more than its own weight of the former. Experiments at Aska, on various manures, showed the best results from a liberal use of phosphates, especially finely-ground spent animal charcoal.

Some data were obtained as to the acreage and production in the new sugar districts of Australia.

In Queensland, in 1873, there were 5380 acres under cane, from which were produced 7987 long tons of sugar, beside 442,253 gallons of molasses, or 1.48 ton of sugar and 82 gallons of molasses per acre. On one plantation, as noted above, 2.22 tons of sugar were obtained per acre from cane of fifteen months old. Of course the yield of sugar depends not merely upon soil, climate, and culture, but also upon care in manufacture; it affords, however, some idea of the former or agricultural conditions.

In New South Wales the estimated average yield is set down as 35 tons of cane per acre, producing nearly  $2\frac{1}{2}$  tons of sugar. The actual results for the season of 1874-75 were, however, 6855 tons sugar, beside molasses, from 4087 acres in cultivation,—or an average of 1.68 tons sugar per acre. In that (late and excessively wet) season, it is stated, the growth was very rank, and as much as 90 tons of cane was in some fields cut from an acre, but the juice was poor and watery.

The ribbon-cane succeeds best, and the plants are placed very far apart—7 feet by 7. The method of cultivation is said to admit of much improvement. It has been ascertained that the cane will only succeed within twenty miles from the coast.

In Egypt it is reported\* that 1 feddan of land (= 4200 square metres) produces on an average 26,727 kilos. of cane, giving 17,640 kilos. of juice, from which are made 2381 kilos. of sugar of all grades, and 528 kilos. of molasses. For an acre this would correspond to 25.4 long tons of cane, 16.8 tons of juice, and 2.3 tons of sugar respectively, or a practical yield of 66.00 per cent. of juice on the cane, and 13.50 per cent. of sugar on the juice. A recent analysis by Kohlrausch† of Egyptian cane shows:

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\* *Catalogue raisonné de l'Exposition Égyptienne, par la Commission d'Égypte, Vienna, 1873, p. 117.*

† L. Kollmann, *loc. cit.*, S. 276.

<i>In 100 parts Cane.</i>	
Juice . . . . .	91.88
Insoluble fibre . . . . .	7.87
Insoluble mineral matter . . . . .	.25
	<hr/> 100
<i>In 100 parts Juice.</i>	
Water . . . . .	81.60
Cane-sugar . . . . .	15.34
Invert-sugar . . . . .	.93
Other organic matter . . . . .	1.14
Ash . . . . .	.69
	<hr/> 100

In the Mauritius an official report to the Governor recommends as the best means of destroying the "*borer*," an insect which, in tropical countries, often inflicts grievous injury upon the cane crop, the soaking for an hour or two before planting the cuttings of cane in a solution of 1 part calcium penta-sulphide in 30 parts of water at a temperature of 125° F. The vegetative power of the cane is said not to be affected.\*

For Louisiana, I am indebted to my friend Dr. Otto Kratz, Superintendent of the Julius Robert Diffusion Process Company, of New Orleans, for the following interesting data,† the results of careful experiments by himself and under his immediate observation :

*Cost in 1875 of cultivating One Arpent of Sugar-cane (average from many plantations).*

Ditching—to drain fields . . . . .	\$6.50
Breaking up, with 4-mule plow . . . . .	1.15
Laying off rows, and opening, with 2-mule plow . . . . .	1.75
Fluking out rows, with 2-mule fluke (earthing up rows) . . . . .	.25
Baring off windrowed seed-cane (uncovering seed-cane previously protected by covering of earth), pulling, shucking, and loading same, hauling, planting, covering with plow and then with hoe . . . . .	6.00
Baring off plants, breaking middles (spaces between rows), and scraping . . . . .	1.60
Baring off, harrowing, and hoeing . . . . .	1.25
Plowing middles, harrowing, and hoeing . . . . .	1.60
" " " " (second time) . . . . .	1.60
Plowing, fluking with 4-mule subsoil-plow, and hoeing (final working—crop laid by) . . . . .	2.50
Blacksmith and helper, coal, etc., for sharpening plows . . . . .	3.00
Feeding mules, and hostler . . . . .	3.00
Reservation of one-fourth of cane for seed, windrowing (covering with earth), and quarter draining same . . . . .	7.30
Cutting and hauling to sugar-house (average distance) . . . . .	6.00
Cost of cane delivered at sugar-house . . . . .	\$43.50 per arpent.
or . . . . .	54.72 per acre.

\* L. Kollmann, *loc. cit.*, S. 283.

† As also for many facts as to the working of the diffusion process, given farther on.

In this estimate no account has been taken of the fact that a considerable proportion of the expense is spread over two, or occasionally even over three, years, when rattoons are allowed to spring up from the same roots and furnish the cane for subsequent working. Nor has any credit been given for forage—field-peas or pumpkins—produced between the rows of cane. Under these two corrections the final result would be much reduced in the experience of a series of years.

*Yield of Cane, from actual weighings, October 9 to December 26, 1874.*

No. of Arpents.	Net Weight of Cane. lbs.
8	241,405
12	403,645
12	437,485
12	392,440
6	277,690
20	622,010
25	464,875
54	1,050,875
20	482,345
12	563,660
16	578,805
12	439,340
12	557,260
12	378,030
20	555,570
20	513,860
40	1,409,860
6	200,710
16	433,835
335	10,003,700

Hence the average yield per arpent is 29,862 pounds, or per acre 37,562 pounds =  $16\frac{3}{4}$  long tons.

To get from these figures the real cost to the manufacturer of sugar of the cane which forms the material with which he commences his work, it is only necessary to add to the sum total, as given in the first table above, interest on the value of the land if the planter makes his own sugar; and, if the cane to be worked be bought from another, a further amount representing the profit of the cultivator.

*Composition of Juice pressed from Cane of many Different Plantations on the Mississippi River from Plaquemines to 30 Miles below New Orleans.*

DATE.	CHARACTER OF CANE.	TOTAL PERCENT- AGE OF SOLID MATTER IN JUICE. (By Hydrometer.)	PERCENTAGE OF CRYSTALLIZABLE SUGAR IN JUICE. (By Polarization.)	PERCENTAGE OF CRYSTALLIZABLE SUGAR IN SOLID MATTER.	REMARKS.
Oct. 26, 1875.	Plant cane.	11.00	7.50	68.2	Barge had been sunk and cane submerged in Mississippi for 36 hours.
Nov. 7, "	"	13.10	8.88	67.7	
" 8, "	"	12.70	8.77	64	
" 9, "	"	13.90	10.31	74.1	
" 10, "	"	15.00	11.62	77	
" 11, "	"	15.00	11.46	76	
" 11, "	2d year rattoons.	16.20	14.61	90	
" 11, "	1st and 2d "	14.70	11.94	81	
" 12, "	"	15.60	11.89	75.8	
" 13, "	"	15.20	12.03	79	
" 17, "	"	15.50	11.69	75	
" 19, "	"	14.50	11.31	77.8	Cane from below city.
" 19, "	"	16.30	14.09	86.4	
" 19, "	"	14.80	11.83	79	Old cane.
" 19, "	"	16.20	13.92	85	Ashton plantation.
" 19, "	"	18.00	16.78	93	Louisa plantation,—cane cut just before experiment.
" 22, "	"	16.50	13.92	84	
" 23, "	"	15.50	13.39	86	
" 25, "	"	14.60	11.36	77	
" 28, "	"	17.50	16.59	94	
Dec. 8, "	"	15.10	14.19	80	
" 9, "	"	15.70	12.88	82	
" 9, "	"	14.50	11.48	79	
" 10, "	"	16.00	13.64	85	
" 11, "	3d rattoons.	16.50	16.46	99.8	Whole cane used for experiment.
" 13, "	1st and 2d rattoons.	15.00	11.89	78	
" 13, "	"	15.10	11.42	75	
" 14, "	"	16.00	13.64	85	
" 14, "	"	16.00	13.32	83	Ashes = 0.95 per cent.
" 15, "	"	16.20	14.66	90	Ashes = 1.00 per cent.
" 16, "	"	17.50	15.42	88	
" 16, "	"	17.00	15.70	92	
" 16, "	"	16.00	13.92	87	
" 16, "	"	17.00	15.42	90	
" 16, "	"	17.00	13.92	82	

With the exceptions noted above, these results were obtained with juice pressed from chips or slices of cane cut for diffusion process, and which had been taken (whole) from the field 5 to 8 days before. They represent, therefore, average juice from the lots of cane used.

The average of these numbers, running through the whole period of experiment, gives 15.53 per cent. of total solids in the juice, including cane-sugar, invert-sugar, and non-saccharine matter, of which 12.91 per cent. is crystallizable sugar, or 83.13 per cent. of the total solids. As the cane was all sound, and had not been long enough removed from the field for inversion to have taken place to a large extent, the large amount of invert-sugar actually present (necessarily representing far the largest part of the 17 per cent. not sucrose) furnishes a corroboration of the Aska results as to the



condition of the juice before complete maturity of the cane. This is an evil to which sugar-planters are specially exposed in regions which, like Louisiana, lie on the outside border of the tropical and sub-tropical belt to which the cane properly belongs, and where, therefore, the season is but a short one.

The "diffusion" process for dissolving out the sugar of the cane, whose introduction into Louisiana will be noticed farther on, furnishes as a residue in an exhausted state immense quantities of the thin chips into which the canes have been cut. These make excellent manure. Their comparatively fine state of division enables them to be easily and uniformly mixed with the soil by plowing in, and for the same reason they soon decompose, restoring to the soil their mineral constituents, forming vegetable mould, and loosening and lightening the earth in which they have been buried. In these respects they present great advantages over the unmanageable masses of "bagasse" from the rollers of the ordinary mills.

In Cuba, on the fine estate of Las Cañas, it appears from the memoranda accompanying the samples exhibited, that during the last three or four years the crop has varied from 4466 kilos. (in 1875-76, a season rendered very unfortunate by drought) to 5588 kilos. of sugar per hectare, or from 1.8 to 2.2 tons per acre. This production is attributed to the use of 5000 tons of manure manufactured on the estate, and including the spent animal charcoal from the filters.

In Jamaica, the statements of the Sectional Catalogue accompanying the collections from the island, that there are at present 48,000 acres in cane, while the export of sugar amounts to but about 30,000 tons, would seem to indicate a very low average of production. Even a liberal allowance for local consumption, and for the diversion of sugar that might be crystallized to the manufacture of rum, would hardly bring the ratio of  $\frac{5}{8}$  of a ton per acre up to a par with that of other countries less fitted by nature for this culture. The estimate formerly assumed as applying to the British West Indies was 30 tons of cane per acre; giving 60 per cent. of juice, or 18 tons; and 18 per cent. on the juice of solid matter in solution, or 3.24 tons; 10 out of which 18 per cent., = 1.8 ton, was obtained as sugar.

In reference to Brazil, information derived from Dr. N. J. Moreira, of the Imperial Commission, goes to show that, although in many of the provinces of the empire sugar-cane is cultivated in a very primitive way, in some districts at least improvement is making steady progress.

Attention is being given to this crop by the Imperial Agricultural Institute of Rio Janeiro, and especially in reference to the selection and propagation of the best varieties, of which twenty-one are to be found on the model farm of the Institute, whence large annual distributions of plants are made. The yield of cane for grinding is very large, as much as 100,000 kilos. per hectare, or 40 long tons per acre, being reported as obtained on new soil at the end of 15 months' growth. It is calculated that each laborer can work 2 hectares, or nearly 5 acres, and that the cane as taken from the field is worth \$3.78 (gold) per 1000 kilos., or \$3.84 per long ton.

In the Hawaiian Islands, it is asserted, the yield of sugar may be assumed to average 3000 lbs., or  $1\frac{1}{2}$  long ton per acre.

#### BEETS.

From manuscript information, for which among other favors I am indebted to M. Charles de Bielsky, Chief of the Imperial Russian Commission, it appears that in Russia the area cultivated in beet-root, and belonging directly to the sugar-mills, was

In 1872-73.	In the region of which Kief is the centre.	61,657 dessiatins	= 166,474 acres.
"	In Poland*	2,774	" = 7,490 "
In 1873-74.	In the Kief district	81,127	" = 219,043 "
"	" Polish*	2,557	" = 6,904 "

From which beet-roots were collected to the extent of,

In 1872-73.	In the Kief district	5,302,101 berkovetz	= 852,123 long tons.
"	" Polish*	209,386	" = 33,651 "
In 1873-74.	" Kief "	5,801,432	" = 932,373 "
"	" Polish*	175,102	" = 28,141 "

These figures represent an average yield of,

In 1872-73.	In the Kief district	5.1 long tons per acre.
"	" Polish "	4.5 " "
In 1873-74.	" Kief "	4.3 " "
"	" Polish "	4.1 " "

Mean of all . . . . . 4.5 " "

Beside the above, the sugar-mills purchased beet from surrounding plantations to the extent of,

In 1872-73.	In the Kief district	5,055,189 berkovetz	= 812,441 long tons.
"	" Polish*	1,695,350	" = 272,466 "
In 1873-74.	" Kief "	5,508,956	" = 885,368 "
"	" Polish*	1,507,737	" = 242,315 "

\* There is obviously some error in the figures for Poland, since they are utterly irreconcilable with the statements as to number of sugar-mills and amount of sugar produced; but this error seems to be one of absolute, not relative amount, so as not to affect the result as to yield. The figures for the Kief district are probably right: if so, they show a very light average yield of roots in Russia as compared with France, Belgium, and Germany. Still lower results are reported from two or three of the individual Russian sugar-factories.

The rapid and immense increase in the cultivation of the beet for sugar in Russia will be shown by the statistics of sugar-production for that country, to be quoted farther on.

In Sweden, where, in 1873, five beet-sugar factories were at work, it is reported that no serious difficulty in the cultivation of the plants arises from climate, and that if the seed is sown early enough, and the crop properly worked, the roots will mature even in the central portion of the kingdom, in latitude  $62^{\circ}$  or  $63^{\circ}$ , which doubtless represents the extreme range of the beet, as  $36^{\circ}$  or  $37^{\circ}$  does for the cane.

As bearing on the probable future development of the beet-sugar industry in the United States, it is to be regretted that there was no exhibition of the ingenious forms of special agricultural machinery in use on the Continent of Europe for beet-root culture. There are also some special agricultural tools for working cane, of Louisiana invention, which ought to have been exhibited.

#### MELONS.

The land on which the culture of the melon for sugar-making has been attempted in California is a part of Andros Island, in the delta between the mouths of the rivers Sacramento and San Joaquin. The island was liable to be submerged at high water, and required the protection of embankments. The soil is light and sandy, but rich. The fruit selected for cultivation is the watermelon with white flesh, which in the locality in question grows with great luxuriance, the leaves soon covering the soil so as to shade it, retain moisture, and keep down weeds. The plants are set in rows twelve feet asunder, and six feet apart on the rows. The crop is said to be a large and reliable one, but I have not yet been able to obtain accurate returns of the yield.

#### III. PROCESSES OF MANUFACTURE, INCLUDING CHEMICAL TREATMENT.

Looking at the manufacture of sugar in a broad way, it may be said to divide itself first into the production of crude sugar from the cane and from beet, the two materials alone employed upon the largest scale and treated by methods careful and economical enough to deserve consideration as scientific industries, while these methods necessarily differ with the different character of the two materials. Then, as a large proportion of the crude sugar so obtained is, in other hands, and often in other countries, carried through an elaborate process of purification, sugar-refining becomes a distinct branch of the manufacture, as in a comparatively simple way it has been from time immemorial in India, practiced there by one caste receiving the supply of

"goor," or crude, moist sugar from another. Of late years there has been a tendency to the separation, as still a fourth branch, of the working up of molasses and syrups, the uncrystallized drainings of the sugars previously manufactured. The different stages of production may, of course, all be completed in the same hands, and the sugar from either cane or beet may be completely refined, and the molasses therefrom put into the various forms in which it is finally to reach consumers, in a single establishment. On the whole, however, the tendency has been rather toward subdivision of the work than concentration, for the world at large. It would be tedious and unnecessary to attempt in this report to describe in full the processes of sugar-manufacture, and to go over in detail the numerous variations of which these methods admit. It may, however, be of some interest to present in the form of tables a condensed analytical statement of the processes in question, neglecting all minor details and steps which can as yet be considered but matters of experiment, but including the more important methods either in general or local use. Thus, in Table I. will be found the usual course of manufacture of cane-sugar, starting with the cane itself; in Table II. the same for beet-sugar, beginning with the root; in Table III. the common process of sugar-refining; and in Table IV. the modes of utilizing molasses.\*

Referring to these tables (I. and II.), it will be seen that the first result to be obtained is the separation of the sugar present from the stem of the cane or the root of the beet, getting it in the form of a watery solution, to be afterwards purified and evaporated.

In the case of the cane, the only method in use until a very few years ago has been mechanical expression of the juice; but lately the "diffusion" method has begun to extend itself from the beet-sugar to the cane-sugar industry, this method depending upon the regulated soaking in successive portions of water of thin slices of cane, and the passage by diffusion or osmose through the walls of the vegetable cells of the sugar which exists in the juice they contain, this sugar gradually accumulating in the water used.

For beet-root four plans have been brought more or less into use: 1st, simple separation by pressure of the juice from roots previously rasped to a pulp; 2d, separation of juice from such pulp by so-called centrifugal force, in the rapidly-revolving drum of the centrifugal machine or hydro-extractor; 3d, maceration of the rasped pulp with water, to be afterwards mechanically separated, holding the sugar in solution; and, 4th, the diffusion process applied to thin slices of unrasped beets.

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\* See pages 21-25.

The method of expression continues to be that chiefly followed by the makers of cane-sugar, but its admitted imperfection has led the most intelligent to a strong desire fairly to test in comparison with it the process of diffusion. This latter, there is strong reason to believe, will to a large extent prove to be the process of the future. It is only by enormous expenditure of power that cane, with its hard, silicious epidermis, can be crushed so effectually as to squeeze out any near approach to the total quantity of juice it contains, and unless the pressure be for some time sustained, the juice actually expressed is largely soaked up again by the spongy mass of fibre, which expands as it is relieved of stress. The mills intended to exert continued pressure yield more juice, but their working has proved slow and difficult; while the roller-mills commonly employed expose the cane to the heaviest pressure for so very short a time that immense quantities of sugar are carried off with the "bagasse" to serve no better purpose than that of fuel under the boilers and evaporating-pans. Moreover, the extent to which the cell-walls of the vegetable tissue are torn leads to a needless amount of foreign substances from these and the intercellular substance getting into the juice, to render its after-treatment more difficult.

At the date of the Vienna Exhibition there was, as far as I know, but one sugar-mill in the world actually using the diffusion method for cane, namely, that of Aska, in southern India, although beet-sugar makers had for years successfully employed it. Since then a factory on this plan has been established in Louisiana by the Julius Robert Diffusion Process Company, subsequently the First Central Diffusion Sugar-Manufacturing Company; and apparently it has also been adopted in British Guiana, since the sugar exhibited from two plantations in that colony as made by "maceration" is doubtless referable to what is understood as diffusion; although, to my regret, I could find no one in charge of the exhibit from whom definite information could be obtained on this point. As there is as yet very little to be found in the general literature of sugar-making in reference to the application of the diffusion process to cane, it will be well to insert here some statement of the results obtained quite recently in Louisiana, where, unfortunately, the depressed condition of the State has led to the suspension for the present of this as of so many other industrial enterprises.

The method employed was the following: The cane, cut by a set of revolving knives into oblique slices of elliptical shape, about 3 or 4 inches long by  $\frac{1}{8}$  to  $\frac{1}{2}$  inch thick, is placed in the first of a series of ten large cylindrical vessels of boiler-plate iron, and steam is let in from the bottom until it has penetrated the whole mass of slices or chips

TABLE I. CANE-SUGAR.

Cane cut, and stripped of leaves.

Juice expressed from cane.

In presses with intermittent action (reciprocal motion).

In presses with continuous action (roller-mills).

Juice.

Bagasse. Bagasse.

Juice.

Saccharine liquid from diffusion battery.

Exhausted chips (bagasse).

Dried, used as fuel, and the ash as manure.

Returned to field as manure, or treated with steam, and again pressed.

Dried in sun, used as fuel, and then ash as manure.

Spread upon land, and plowed in as manure.

Exhausted bagasse. Weak saccharine liquid. Might well be used as material for paper.

Cleared of fibre by settling in tanks.

Simply evaporated to dryness, producing "concrete," to be afterwards refined.

Liquid heated in clarifying-pans, with addition of lime (often of sulphurous acid, or calcium acid sulphite).

Skimmed.

Skimmed, and run through coarse bag filters.

Clear liquid, boiled down in open pans.

Scum. Scum. Scum. Used to make rum (often thrown away).

Allowed to crystallize in coolers.

Boiled down (sulphurous acid sometimes added).

Dried in centrifugal machine.

Transferred to potting cakes, and drained.

Transferred to forms or moulds, and drained.

In open pans. Partly in open, partly in vacuum-pan.

Allowed to crystallize

partially in pan, then

Molasses. Re-boiled for ad products, used as food, or to make rum.

Soft centrifugal sugar. Molasses. Re-boiled for ad products, used as food, or to make rum.

Soft brown sugar (often called muscovado). Clayed, or washed.

Molasses and drainings. Re-boiled for ad products, used as food, or to make rum.

Clayed sugar. Transferred to forms or moulds, and drained.

Green syrup. Green syrup. Sugar. Washed with a little water or syrup.

Sugar. Washed with a little water or syrup.

Used as food. Drainings. Returned to battery, to be reboiled.

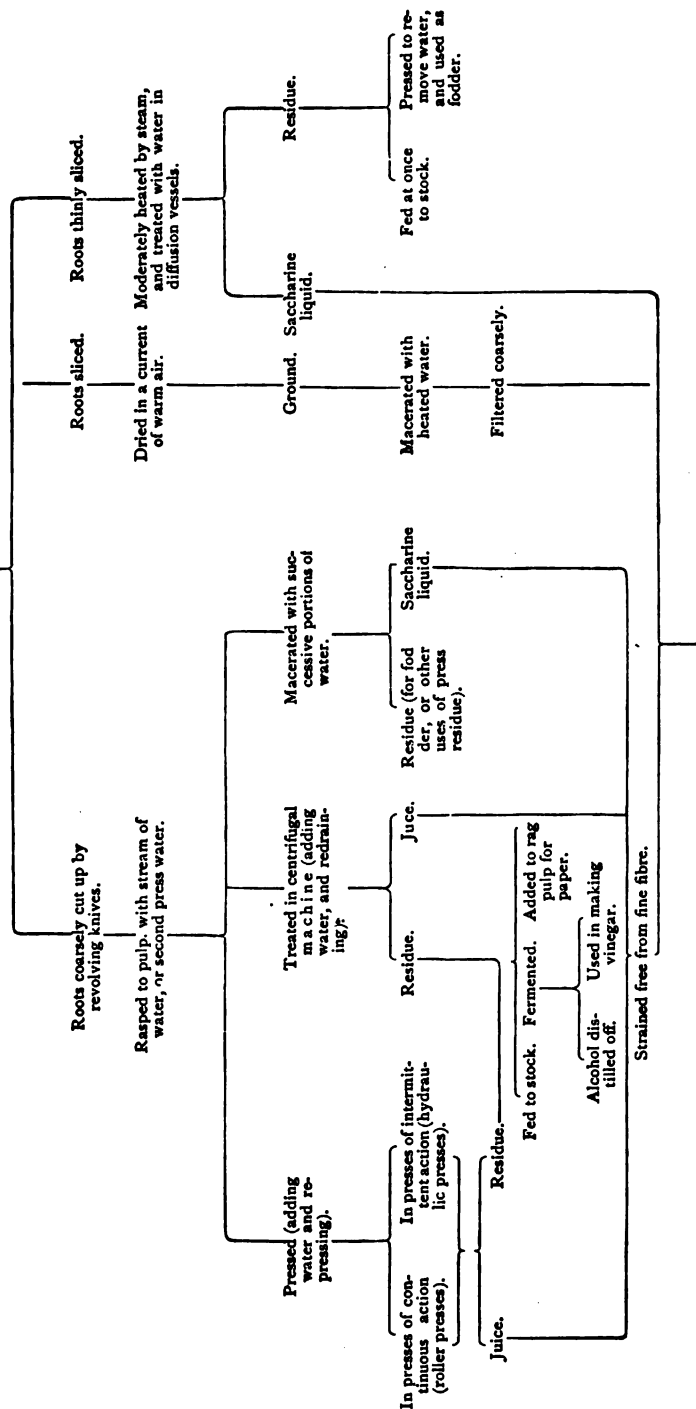
Form sugar (nearly white).

Centrifugal sugar crystals (nearly white).

TABLE II. BEET-ROOT SUGAR.

Tops and points cut off.

Roots washed.



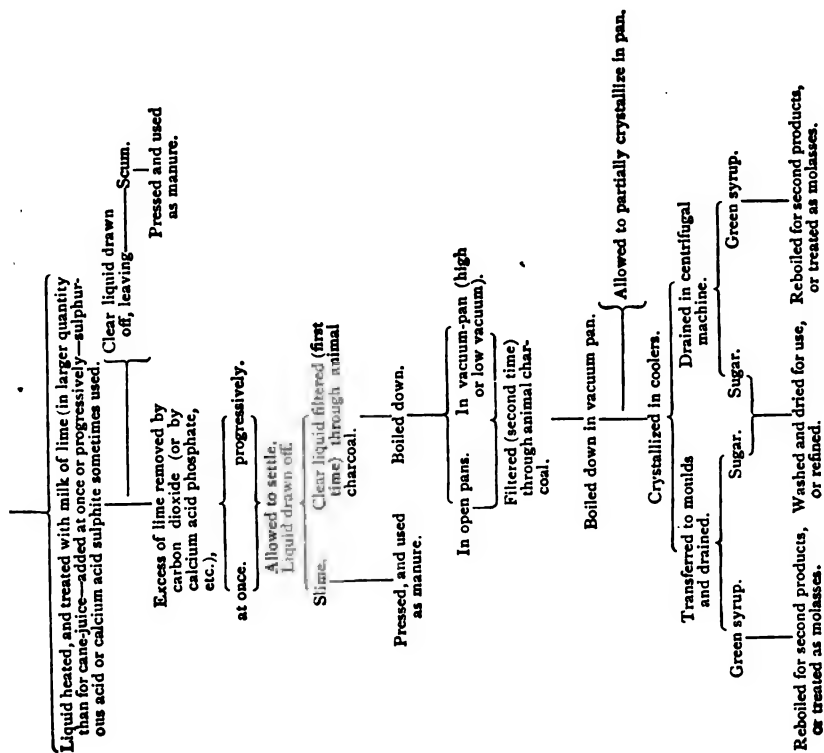
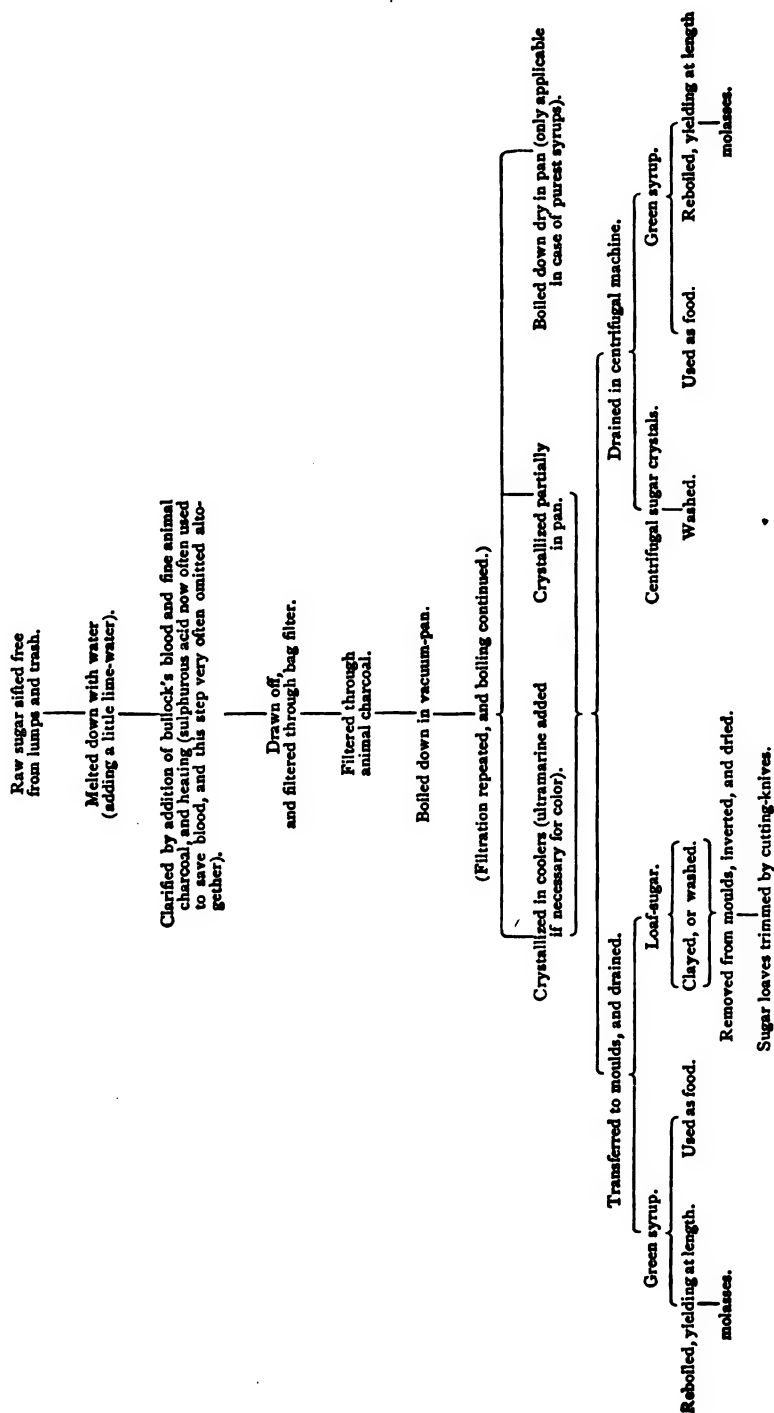




TABLE III. SUGAR REFINING. (Cane or Beet.)





and begins to escape at the top; steam is then shut off and cold water is turned on from an elevated tank, passing on its way through a heater by which its temperature is raised, until the vessel is filled. While in this vessel "diffusion" is taking place, and sugar is passing out from the (unbroken) cells of the cane-slices into the water, the next vessel (No. 2) is being similarly filled. The chips in this having been steamed, water is again turned on from the tank through the heater into No. 1, driving the liquid by hydrostatic pressure out of No. 1 into No. 2 through the connecting-pipe, which has in the mean time been opened. No. 3 is filled, steamed, and charged with juice through No. 2, as above. When No. 4 is filled with chips, cold water is let directly from the tank into No. 1, driving the juice which was in it through the heater into No. 2, and from 2 to 3, and 3 to 4; next, cold water into No. 1, and from 1 to 2, from 2 through the heater into 3, then directly into 4 and 5, and so on, care being taken to preserve the temperature of the last vessels filled at about 190° to 200° F. When the hot juice has passed through No. 7 it is considered sufficiently concentrated, and is discharged into the sugar-house. No. 1 is now emptied, and No. 2 becomes the first vessel in the battery, and the work goes on as before, there being always seven vessels working, one vessel being emptied, and two being refilled; so that, practically, when the work is in full operation, as fast as one vessel is filled a charge of concentrated juice goes into the sugar-house, and one vessel with exhausted chips is emptied. The discharging of the chips is done through a large man-hole near the bottom of the diffuser, the exhausted chips being received on a carrier, which drops them into the bagasse carts. The emptying of a vessel was accomplished by two men in from 6 to 8 minutes, including the opening and closing of the man-holes. The filling of a vessel with chips required 12 to 15 minutes.

The following table shows the state of each diffusion vessel at the moment of making the first discharge of juice to the clarifiers. It also represents the normal condition of the battery in regular order of working:

NUMBER OF VESSEL.	TEMPERATURE OF JUICE.	SPECIFIC GRAVITIES OF JUICE.	PERCENTAGE OF SOLID MATTER IN JUICE BY SACCHAROMETER (AT 63½° F.)	DEGREES, BEAUME, AT 63½° F.	REMARKS.
No. 1.	70° F.	1.00030	.08	0.048	These figures refer to results obtained with cane which yielded by expression juice of 7½° Beaumé.
" 2.	85° "	1.00310	.80	0.44	
" 3.	90° "	1.00544	1.40	0.80	
" 4.	120° "	1.01134	2.90	1.6	
" 5.	200° "	1.01618	4.12	2.3	
" 6.	180° "	1.02537	6.45	3.6	
" 7.	190° "	1.04599	11.40	6.3	

The density of the saccharine liquid or juice from the diffusion vessels was found to be uniformly from a degree to a degree and a half Beaumé less than that of juice obtained by expression from the same cane, and this represented from 16 to 20 per cent. more water to be evaporated, entailing an additional expense of about 17 cents upon each 1000 pounds of cane treated, estimating wood at \$3.00 per cord and coal at \$0.75 per barrel of 200 pounds.\*

Taking this difference of density into account, and calculating from it the amount of "mill juice" (or juice of the density obtained by pressure in the ordinary roller-mill) equivalent to the amount of "diffusion juice" actually turned out, it appears that about 83 or 84 per cent. on the weight of the cane was secured (thus, in one run with 957,600 pounds of cane, the equivalent of 84.39 per cent. of mill juice, and in another, with 987,945 pounds, the equivalent of 82.95 per cent.). This is very largely in excess of the result obtained by pressure, when this last has been accurately determined, not merely guessed at. Thus, M. Dupuy,† in an official report to the French Government, stated, from numerous careful experiments with the mills most generally used in Guadeloupe, that 59.3 per cent. of juice on the weight of cane was obtained, the highest result which he got being only 61.8 per cent., and the average which he considered to apply to the whole island, 56 per cent. Avequin gave the yield in his time in Louisiana as 50 per cent. Sénez, in Cayenne, found but 36 per cent.; while Guignod, in Martinique, by two successive rollings, obtained 70 per cent.‡ The best result obtained in Louisiana by careful hand-feeding of the rolls with single canes was experimentally found 66 per cent., and Mr. H. McCall, of Evan Hall plantation, a most successful worker with the roller-mill, reports as the result of the work on his place in 1874-75, that 22,204,670 pounds of cane gave 1,417,800 gallons of juice at 7° to 8° Beaumé, = 12,476,640 pounds, or 56.19 per cent.§

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\* This account of the process is from a report by Mr. L. Kollmann, chemical director of the Julius Robert Diffusion Company, to Dr. Otto Kratz, superintendent of the company.

† N. Basset, *Guide pratique du Fabricant de Sucre*, p. 726.

‡ Id.

§ A later report, from the well-known "Bowdoin" plantation of Mr. Duncan F. Kenner, gives as the result of the grinding of the crop of 1875-76:

Cane ground . . . . .	14,983,339 pounds (exact weight).
Juice extracted . . . . .	951,100 gallons.
Or, at 8½ pounds per gallon . . . . .	8,084,350 pounds of juice.

Equivalent to 53.95 per cent. on the weight of the cane. In this case the lower result than that of Mr. McCall is attributed to part of the crop having been ground with broken housing, so that the mill could not be covered up.

One obvious cause of the poor yield from the rollers is the protection afforded by the

As regards the rate at which the diffusion process could be worked, the results were also satisfactory. It was found that 69 of the diffusion vessels as used could, when there was no delay, be filled and discharged in a working day of 20 hours, each vessel containing an average of 4200 pounds of cane-chips, so that 289,800 pounds of cane might be disposed of in this time. In a continuous run of  $5\frac{3}{4}$  days, an average of 230,000 pounds per day was worked off, against a daily average of 247,000 pounds passed through a good roller-mill on the same plantation in a run of 6 days.

In one respect the process was somewhat unsatisfactory, especially in the earlier experiments: the proportion of molasses obtained, as compared with crystallized sugar, was too high. Thus, in the first two trials, in one run of 6 days, 51,706 pounds first and second sugar, and 50,778 pounds of molasses; in one run of 5 days, 54,549 pounds first and second sugar, and 38,752 pounds of molasses were made; still lower results were also obtained, and from some of the boilings the strong syrup refused to crystallize until after a delay of many days. The cause of this trouble seems, however, to have consisted in the inferior evaporating arrangements available on the plantations where the process was first tried,—only open kettles and an inferior Rillieux vacuum-pan of insufficient capacity being employed. In the second season's work quite a satisfactory ratio of sugar to molasses was obtained. The larger amount of water to be evaporated from the diffusion juice necessarily increases the time during which the boiling is continued, and the tendency to "inversion" of the sugar is thereby increased; the more so the higher the temperature at which the boiling is conducted. Hence it appears to be shown that the diffusion juice should only be carried through the earlier stages of evaporation in open pans, and the process be finished with the aid of a vacuum; or, preferably, that the whole evaporation should take place in vacuum-pans with progressively reduced pressure.

As regards the cost of manufacturing sugar at present in Louisiana by the mill and diffusion processes respectively, the following comparative experiments may be quoted.

A contract was entered into by the Julius Robert Diffusion Company and Messrs. E. & J. Kock, of Belle Alliance plantation, in Ascension Parish, under which successive "runs" were made by the roller-mill already on the plantation, and by a set of diffusion vessels erected by

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hard surface of the cane to the cells of the central portion, which contain most juice. In the diffusion process the transverse slices lay open all parts of the structure fairly to the action of the water.

the company, the results being daily verified and reported by representatives of the contracting parties; a portion of the surplus product, if any, to be paid for to the Diffusion Company.

The official report was as follows:

MILL RUN, OCTOBER 12-17, 1874.		DIFFUSION RUN, OCTOBER 26-31, 1874.	
Cane consumed	. . . 1,386,730 pounds.	Cane consumed	. . . 987,945 pounds.
Density of cane-juice	= $7\frac{3}{4}^{\circ}$ to $8^{\circ}$ B.	Density of cane-juice	= $7\frac{3}{4}^{\circ}$ to $8^{\circ}$ B.
PRODUCTS.*		PRODUCTS.	
First sugars	. . . 43,893 pounds.	First sugars	. . . 35,595 pounds.
Second sugars	. . . 13,850 "	Second sugars	. . . 16,111 "
	<u>57,743</u> "		<u>51,706</u> "
Molasses	. 3597 gallons = <u>43,170</u> "	Molasses	. 4249 gallons = <u>50,778</u> "
Total sugar and molasses	. 100,913 "	Total sugar and molasses	. 102,484 "
Percentage of sugar to cane used	. . . . 4.164 per cent.	Percentage of sugar to cane used	. . . . 5.234 per cent.
Percentage of molasses to cane used	. . . . <u>3.113</u> "	Percentage of molasses to cane used	. . . . <u>5.139</u> "
Percentage of sugar and molasses to cane used	. 7.277 "	Percentage of sugar and molasses to cane used	. 10.373 "
		Excess of diffusion over mill products	= $42\frac{1}{2}$ per cent.
		(7.277 : 10.373 : : 100 :	
		142.54).	

\* In confirmation of these figures, as representing average results of working by the usual mill process on the large scale, the following statement of the products from Mr. Kenner's crop of 1875-76 (above referred to) may be quoted. 951,100 gallons of juice, from 14,983,339 pounds of cane, gave 214,566 gallons of syrup at  $25^{\circ}$ - $27^{\circ}$  B., from which were made

Sugars—firsts	. . . . . 457,952 pounds.
" seconds	. . . . . 211,823 "
	<u>669,775</u> "
Molasses—31,470 gallons =	. . . . . 407,905 "
	<u>1,077,680</u> "
Equivalent to	
Dry sugar	. . . . . 4.470 per cent.
Molasses .	. . . . . <u>2.722</u> "
	7.192 " on cane used.

After taking into account the great loss of juice in expression, it must be borne in mind that Louisiana cane only contains at best 14 or 15 per cent. of sugar of all kinds, instead of the 18 or 20 per cent. of tropical cane.

COST OF MANUFACTURING.	
Negro labor and rations . . . . .	\$353.20
White labor . . . . .	133.50
Fuel—wood . . . . .	318.00
“ —coal . . . . .	437.75
Coal-oil, lard-oil, and tallow . . . . .	21.55
Total . . . . .	<u>\$1264.00</u>
Therefore, 1000 pounds of sugar and molasses cost to manufacture . . . . .	\$12.53
Assuming cane at \$5.00 per ton (too high): cane, 13,742 pounds at \$5.00 per ton . . . . .	34.35
Cost of manufacturing . . . . .	<u>12.53</u>
Total cost of 1000 pounds sugar and molasses . . . . .	<u>\$46.88</u>

COST OF MANUFACTURING.	
Labor of all kinds . . . . .	\$575.05
Fuel—coal . . . . .	579.75
“ —wood . . . . .	371.25
Coal-oil, lard-oil, and tallow . . . . .	21.55
Total . . . . .	<u>\$1547.60</u>
Therefore, 1000 pounds of sugar and molasses cost to manufacture . . . . .	\$15.10
Assuming cane at \$5.00 per ton (too high): cane, 9640 pounds at \$5.00 per ton . . . . .	24.10
Cost of manufacturing . . . . .	<u>15.10</u>
Total cost of 1000 pounds sugar and molasses . . . . .	<u>\$39.20</u>

In this statement the sugar and molasses are finally thrown together, and, since in this as in other early experiments the amount of molasses produced from the diffusion juice was too large in proportion, it is perhaps more rigidly fair to base the comparison on the cost of producing a hogshead of sugar (taken at 1150 pounds) and the accompanying molasses (be the latter little or much). Putting the above figures into this form, and substituting for the assumed value of the cane (\$5.00 per ton), the value deduced from data to be found on former pages as to cost of cultivation (interest on value of land omitted), viz., \$54.72 per acre, and yield, viz., 37,562 pounds per acre, giving \$1.457 per 1000 pounds of cane, we get :

MILL PROCESS.	
For 1 hogshead of sugar and accompanying molasses :	
Cane, 27,618 pounds . . . . .	\$40.24
Cost of manufacturing . . . . .	25.17
	<u>\$65.41</u>
Molasses accompanying 1 hogshead of sugar . . . . .	71.6 gallons.

DIFFUSION PROCESS.	
For 1 hogshead of sugar and accompanying molasses :	
Cane, 21,973 pounds . . . . .	\$32.01
Cost of manufacturing . . . . .	34.42
	<u>\$66.43</u>
Molasses accompanying 1 hogshead of sugar . . . . .	94.5 gallons.
Showing a surplus of 22.9 gallons, worth, at 50 cents per gallon, \$11.45, or, after deducting \$1.02 difference of cost as above, a clear balance of \$10.43 in favor of the diffusion process.	

As the production of this large amount of molasses is by no means a necessary result of the diffusion process, and was, in fact, avoided in later trials, the substitution for the surplus of its equivalent amount

of the more valuable crystallized sugar would of course give a still more favorable balance. In this experiment, it is to be remembered that the new process was tried with all the disadvantages of inexperience and of apparatus employed in the place for the first time, as against the regular plant of the mill, which had been long in use, and the experienced work of those who were familiar with it.

The following report of a run made by diffusion upon the Louisa plantation, in St. Charles Parish, under specially disadvantageous circumstances, will serve to show that this process may be carried out with profit even under conditions which would be certain to entail loss if the old method of expression were employed :

Cane worked up in entire run . . . . .	2,646,793 pounds.
Expenses :	
Total pay-rolls . . . . .	\$3,490.35
Towage and use of barges with some cane from Ashton plantation . . . . .	551.70
Food of mules, oil, use of plantation-wagons, and sundry small supplies . . . . .	276.86
Coal consumed . . . . .	1,080.00
Gasoline . . . . .	169.20
140 hogsheads, delivered at \$3.25 . . . . .	455.00
197 barrels, delivered at \$1.30 . . . . .	256.10
	<hr/>
	\$6,279.21
Cane, taken at above rate of \$1.457 per 1000 pounds . . . . .	3,855.38
Transportation to hands of purchaser (freight, cooperage, weighing, tarpaulin and shed, commission to broker, insurance, loss of weight, leakage, etc.) at \$8.62 per hogshead of sugar and accompanying molasses . . . . .	1,206.80
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Total . . . . .	\$11,341.39
Or, \$81.01 per hogshead of sugar with accompanying molasses.	

Proceeds :

140 hogsheads {	1st sugars . . . . .	121,487 pounds = 4.59	} per cent. on cane.
	2d " . . . . .	33,490 " = 1.27	
		<hr/>	
		154,977 " = 5.86	
197 barrels molasses . . . . .		8,179 gallons = 3.71	
		<hr/>	
		9.57	

which gave net returns, as per account sales, of \$14,034.45, or \$100.25 per hogshead of sugar with accompanying molasses.

It is remarked upon this by Messrs. Anderson and Simpson, the reporters, that cane was not supplied fast enough to keep the machinery steadily at work (the "run" having, in fact, lasted 26½ days, while the actual work took but 16 days out of this time, so that wages and fuel were greatly wasted); that only one-half of the avail-



able machinery was run, while the skilled labor employed was sufficient to run the whole, and thus double the production at a small additional cost of labor; and that about 400 tons of the cane first used had been cut, and was lying exposed to sun and rain for 14 days before being used during very warm weather in November and December. Furthermore, no plant cane was used, only first-, second-, and some third-year ratoons; and it will be noted that there is a heavy charge for barges and towage in bringing a portion of the cane from another plantation.

In none of the above statements has account been taken of cost of general supervision, engineering, repairs, wear and tear of machinery and buildings, insurance on the same, and taxes for working either of mill or diffusion processes.

Allusion will be made farther on to an apparatus intended for diffusion as applied to the cane, of which a model was exhibited at Philadelphia. There has also been lately tried in Louisiana a steam maceration process, proposed by a Mr. Mason, which is said to promise an increased yield of juice. The bagasse from the ordinary roller-mill is conveyed on an endless apron or carrier through a series of inclosed chambers, into each of which exhaust steam from the engine is delivered through a V-shaped pipe perforated at the bend. This steam strikes upon the bagasse, which is meanwhile kneaded by small independent rolls. The condensing steam softens the fibres and delivers the mass in a soft and pulpy condition to a second roller-mill, where it is again pressed, affording an additional amount of juice, which in the trials reported ranged from 15 to  $17\frac{2}{3}$  per cent. on the yield in the first mill, the density being  $\frac{1}{2}^{\circ}$  to  $1^{\circ}$  B. less. Accurate determinations of cost, including extra power needed, are, however, wanting; and the degree of injury to the quality of the juice by the thorough breaking up of the structure of the cane should not be overlooked. In the diffusion process the thoroughly rational principle of injuring the vegetable cells as little as possible is practically carried out.

In beet-root sugar factories the diffusion process has come into use on quite a large scale, and seems to be steadily extending of late years, while the treatment of rasped pulp in the centrifugal machine and by maceration seems to be falling into disuse. In the German Empire, in 1873-74, out of 337 establishments, beet-juice was obtained by pressure in 214, by diffusion in 80, by maceration in 31, and by the centrifugal machine in 12.\* The Robert diffusion process has been

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\* R. v. Wagner, *Jahresbericht üb. d. Leist. d. chem. Technol.*, 1875, S. 779.

most largely adopted in Germany, Austria, and Russia, in which countries 235 factories employed it in 1873, out of a total number of 243 in which it was then established.\* The maceration process of Walkhoff and Bobrynski is almost confined to Russia, whence beet sugar thus made was exhibited from the factories of Młodzieszyn, Guzow, and Krasiniec, each with a system of 2 presses and 8 macerating vessels, while Łyszkowice and Hermanov illustrated the diffusion method, carried on at each with 18 diffusion vessels in 2 batteries. In 1873, out of 5 beet-sugar factories in Sweden, 3 were worked on the diffusion plan. This is reported as also employed in at least one of the California establishments, while in another of these and in Illinois the centrifugal machine has, I believe, been in use. The chief changes of late in the older method of expression have been the replacement in many cases of hydraulic presses by those of continuous action,—systems of rollers,—and the more general practice of straining out the fine fibres left in the juice as it comes from the press.

The further treatment of the juice, whether of cane or beet, divides itself naturally into those processes which aim at turning out at once a marketable product, of higher or lower grade, ready for the consumer, and those which are intended merely to concentrate the sugar into a small bulk, and render it capable of being kept without deterioration until it reaches the hands of the refiner.

Under the former head the simplest process is that of "concreting," or rapidly evaporating the juice down to a solid mass, for which "Fryer's concretor," invented some ten years ago, seems to be the most successful form of apparatus. The report of Mr. Martineau on sugar statistics, to be quoted farther on, shows that this process is now employed upon a fairly large scale, and in a number of different countries. There were exhibited at Philadelphia some specimens of sugar from China, the Philippine Islands, and Hawaii which might be classed under the head of "concrete." Such a product can be made with very simple means and small expense, and has the advantage of supplying in a form little subject to chemical change material for the working, all the year round, of large refineries with elaborate plant and skilled labor, such as involve an investment of capital too large for profitable employment during the short season of a sugar harvest only. The different circumstances under which cane- and beet-juice respectively are obtained render the concreting process

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\* Joseph Adler, *Verzeichniss d. Zuckerfabriken in welchen d. Julius Robertsche Saft gewinnungs-Verfahren eingerichtet wurde.* Wien, 1873.

better fitted for application to the former than the latter. Cane-juice contains but little besides sugar, but is subject to atmospheric conditions highly favorable to speedy inversion of sucrose, while the labor available for its manufacture is often unskilled and careless,—the advantage of getting it as promptly as possible into an inalterable form, by cheap and simple means, is obvious; while beet-juice contains so much foreign matter that the safety of boiling down the sugar with it prior to any purifying treatment is perhaps more doubtful, and the countries of its production are better adapted to successful complete manufacture on the spot.

When the production of crystallized sugar is aimed at, the first step is clarification. Lime continues to be the substance mainly relied upon in aid of the heating necessary to coagulate albumen.\* In Louisiana the acid sulphite of calcium, much used in connection with this process some years ago, has been to a large extent laid aside, and sulphur dioxide gas from the combustion of sulphur is generally preferred. Many planters here, and I believe also in the West Indies, show a disposition to rely too much upon this use of sulphur on account of the—at any rate temporary—bleaching effect upon the sugar, serving, as they suppose, to enable them to dispense with animal charcoal for the same purpose. Even if it be conceded that sulphurous acid does not of itself cause inversion of cane-sugar and production of molasses, the readiness with which it takes up oxygen and becomes sulphuric acid, of whose effect upon the sugar there is no question, ought to lead to caution in this practice.

In the treatment of beet-juice a much larger quantity of lime is used than for that of the cane, and hence clarification has to be followed by de-liming, as it has been called. Nothing could be ascertained at Philadelphia as to any extension of the use of phosphoric acid, acid phosphates, or any other material for this purpose than carbon dioxide gas passed through the heated juice. The chief variations in the mode of using this gas seem in Europe to turn upon its employment once for all, throwing down all the lime, or by partial precipitations, alternating with small successive additions of lime; and the removal beforehand, by drawing off or filtration, of the clarification scum, or the precipitation of the turbid liquid still containing this.

Decolorization by filtration through animal charcoal may be the

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\* More than one series of experiments seems to have shown that magnesia presents some real advantages over lime as a clarifying agent, but its use has not become general upon the large scale. It may be employed as hydrate or phosphate.

next step, but this, for a very large proportion of the raw sugar made from the cane, is the exception rather than the rule. Few features of the Philadelphia Exhibition were more interesting in this department than the choice specimens of white sugar made direct from cane-juice,—*i.e.*, without having passed through the refiner's hands,—and among these were a few, very nearly white, which professed to be made either altogether without, or with a very sparing use of animal charcoal. One of the best of these came from Brazil. But of those in whose manufacture bone-black had been used, several might well have been taken for refined sugar. Among the most remarkable of these were samples from Cuba, exhibited by Doña Emilia Sama de Garcia Muñoz and by Don Julian de Zulueta (boiled in open pans). Some centrifugal crystals from Guadeloupe, and fine, but sharp grained, centrifugal sugar from Spain, were also direct products from cane-juice. Of animal charcoal itself there were scarcely any samples, and very little was to be learned as to its preparation or use. Several of the Russian beet-root sugar factory reports, obligingly furnished by M. de Bielski, state their consumption of bone-black as about 20 per cent. on the weight of sugar manufactured. The tendency, both among cane- and beet-sugar makers, to reduce or dispense with the use of this admittedly costly material, seems by no means a fortunate one. In the production of the higher classes of sugar the undue saving of animal charcoal is always attended with loss in the quality or quantity, or both, of the sugar itself. None of the numerous substitutes which have been tried seem to have approved themselves in actual use, and the most valuable improvements have been confined to the details of the method of originally charring the bone-black, and revivifying it after it has been used. The kilns have been simplified, and their working rendered more economical; and the washing of the spent char, fermentation, treatment with hydrochloric acid (as gas or in solution), and removal of iron have received closer attention.

The boiling down, or evaporation of the syrup, comes next, though often in part preceding or alternating with filtration through bone-black. For this the use of the vacuum-pan has steadily extended more and more from the refiners to the manufacturers of raw sugar. The Exhibition presented some very handsome illustrations of its use in the direct treatment of cane-juice,—notably in the case of the beautiful sugars contributed by Don Juan Poey, of Cuba. There were also very good samples from the Sandwich Islands,—as those of James Makee, of Maui, and the Lihue Plantation Company, of Kauai, Hawaii. In regard to raw beet-root sugar, the amount of pains be-

stowed upon the evaporation partly depends on the intention to complete the manufacture at once, or to dispose of the raw product to the refineries. The latter plan—division of the work—is apparently on the increase, and now constitutes the general rule in most countries of large production, Germany being the chief exception.

As regards the crystallization of the concentrated syrup, the chief change to be noted of late years is, perhaps, the more general practice of crystallizing much of the sugar in the pan itself, before the mass goes into the coolers; fine, sharp-grained sugar is largely produced in this way. It is reported that European manufacturers of beet-sugar habitually add a little cane-sugar with the intention of improving the grain. Indigo carmine has been recommended as a substitute for ultramarine in neutralizing the faint yellowish tinge of imperfectly decolorized sugar in loaves; but apparently ultramarine is in general use in the Russian factories, judging from the numerous samples exhibited, in some of which rather too free use of the color had been made.

In washing the crystallized sugar after draining, the long-used process of "claying,"—*i.e.*, placing on the top of the mould of sugar a layer of wet plastic clay, from which the water slowly seeps through the sugar, carrying away the molasses before it,—by which a very large proportion of the sugar of Brazil is made, and which has been much practiced in the West Indies,—is to a large extent supplanted by the actual pouring on, with special precautions, of clear syrup, sufficiently concentrated not to dissolve away too much of the crystalline mass; this being another instance of the methods originally peculiar to the refiner gradually becoming applied to the manufacture of raw sugar. Upon the amount of this strong syrup dried up within the mass, as well as upon the character of "grain" induced in the crystallization itself, depends the hardness of loaf-sugar. The beet-sugar of Russia in the Exhibition presented a most remarkable degree of hardness, the loaves ringing when struck almost as a piece of cast-iron would have done. This is explained by the Russian mode of using sugar with tea: not dissolving it in the cup, but placing a lump in the mouth and allowing the tea to flow over it in drinking; for this the sugar must be hard enough not at once to crumble down. In washing centrifugal sugars use is now frequently made of a jet of steam diluted with air, or a very fine spray of water, instead of liquid water or syrup in mass.

As regards sugar-refining, there was nothing specially new or

important to be gathered from the Exhibition, though there were excellent results shown presumably of well-known processes. The refined Australian cane-sugar of the Colonial Sugar Company, of Sydney, and the French and Russian refined beet-sugars, were highly creditable. One looked with interest, but in vain, for any illustrations of the work done in the large and excellent American refineries, and with some curiosity for any results obtained by the alleged use of ozonized air and hydrogen dioxide as decolorizing agents.

Nor was there anything to be learned as to the treatment of molasses, except that some fair samples were shown of sugar from reboiling,—2d and 3d products. No specimens were to be found in connection with the processes involving the use of alcohol, nor those in which precipitation of sugar has been effected by lime or baryta. Dubrunfaut's method of getting rid of a large proportion of the saline impurities preventing crystallization of sugar, by dialyzing the molasses in a long trough divided into flat, narrow cells by diaphragms of parchment-paper, with water interposed between the alternate cells, was also unrepresented. I learn from my esteemed colleague, M. Kuhlmann, of Lille, that near that city MM. L. & B. Collette have lately been experimenting at Seclin upon the removal of the salts from molasses by electrolysis, using a divided trough similar in general arrangement to that of Dubrunfaut, but having the positive and negative poles of a powerful Gramme magneto-electric machine immersed in the alternate cells containing water. By means of a very intense electric current the salts in the molasses of the intervening compartment are decomposed, and their acid and basic components are taken up by the water, which is constantly renewed. Osmose of the salts themselves does not occur as long as the current is maintained, but commences as soon as this is interrupted. MM. Collette have informed M. Kuhlmann that with molasses originally containing 15.75 per cent. of salts it was found after 12 hours continuous electrolysis the amount had been reduced to 10.57 per cent., and after 24 hours to 6.40 per cent., and the reboiled syrup seemed perfectly capable of crystallizing.

Nothing was to be learned from the Exhibition as to the manufacture of cane-sugar in specially large crystals—"sugar-candy," such as is consumed by the makers of sparkling wines.

There was nothing novel about the limited exhibition of maple-sugar. The one Italian specimen from sorghum was remarkably well

crystallized and drained for this variety. Small quantities of sorghum-sugar and syrup are said to be habitually made in Egypt, but the manufacture scarcely rises above the level of a merely domestic art.

The character of much of the starch-sugar to be found in the market has improved of late years; it is freer from unconverted dextrine, drier and less soapy in consistence when presented as a crystalline mass, clearer and brighter when in the form of a thick syrup. The extensive demand for it, to be used in brewing, wine-making, the manufacture of table-syrups and factitious honey, has led to increased pains being bestowed upon its production.

The use of little water, but under a pressure of several atmospheres in close vessels, for the chemical conversion of the starch, and the employment of animal charcoal and the vacuum-pan afterwards, have been the chief directions of improvement.

A distinct and interesting form of sugar from starch has been more clearly pointed out than heretofore, and its manufacture patented in England by Messrs. O'Sullivan and Valentine,—viz., "maltose," distinguished by a rotatory effect upon polarized light much greater than, though in the same direction as, that of dextrose, namely  $[a] = +148^\circ$ , as against  $+53\frac{1}{2}^\circ$ . It reduces but two-thirds as much cupric oxide as dextrose, and is itself isomeric with sucrose. It is produced, along with dextrine or starch-gum, by the action of an infusion of malt upon starch-paste; and may also be obtained by arresting at the proper stage the action of heated dilute sulphuric acid upon starch, used by preference in the form of ground rice. The liquid contains a mixture of maltose and dextrine in determinate proportions,—practically two-thirds of the former and one-third of the latter,—and after neutralization with chalk is evaporated in a vacuum-pan to a cake, which is the material recommended for brewers' use. Of this there was no specimen at Philadelphia.

The sectional catalogue of the Japanese department of the Exhibition contains an interesting notice of the production and use of starch-sugar (maltose, dextrose, or both) in Japan, where, it is stated, this manufacture has been long known. "Millet and rice are used for the purpose, and, after having been steamed, they are mixed with a certain quantity of malt or ferment, and kept for several hours, at a fixed temperature, in close vessels, after which the liquid portion is strained and concentrated by evaporation to a strong syrup or a solid mass, which is formed into bars while still hot. Vendors of this starch-sugar are often to be met with in the streets, where, to the great enjoyment of children, they manufacture all sorts of animals

and figures with this material by a process quite similar to that of glass-blowing."

#### IV. MACHINERY AND MECHANICAL APPLIANCES.

Before speaking of the contrivances directly concerned in the manufacture of sugar, it may be well to notice some mechanical arrangements for conveying to the factory the great masses of crude material—cane and beet-root—which have to be dealt with. Upon this point more attention is bestowed than formerly, and with economical results which, under some circumstances, become quite important. Several bits of information in regard to such arrangements were gleaned from the Exhibition.

Thus, in a published letter of His Excellency Señor Don Tomas Rodriguez Rubí, Royal Commissioner for regulating the Treasury of the island of Cuba, in reference to the Las Cañas estate of Don Juan Poey, it is remarked that the adoption of a portable railroad, which has been in successful operation since the season of 1874-75 for the transportation of all the cane, fuel, and other materials, has enabled the number of draft-oxen on the plantation to be reduced from 500 to 250. At Seelowitz, in Austria, Herr Julius Robert, the inventor of the most generally successful form of diffusion apparatus and the one in most extensive use, has brought into use the transportation of beet-roots, manures, etc., partly by means of tramways and partly in buckets suspended from an elevated wire rope. In Hawaii, near Hilo, in a rough and broken country, with miserable roads, sugar-cane and wood for fuel are brought down to the mills—often a distance of four or five miles—by floating them in flumes or wooden troughs, like those in such extensive mining use in California. Of these flumes some thirty miles in all have been built, carrying them with a regular incline over ravines and hollows on elevated trestle-work, and a notable saving in the cost of carts and teams has thereby been effected. In Louisiana, great advantages in the way of natural water transportation are presented for the concentration of sugar-making in large factories, with complete plant and skilled labor and supervision, bringing together material from numerous plantations, the owners of which should devote their attention solely to the cultivation of the cane, selling it to the manufacturer, as is so largely done in the case of the beet, on the basis of its weight, the yield and character of the juice. Barges of simple construction might be used, not only on the Mississippi and other large rivers, but on innumerable bayous and small connecting streams which cover like a net-work a large portion of the State.



The most remarkable change of system in regard to the beet-root sugar production in Europe has been the adoption on quite a large scale in France and Belgium of the Linard method of underground transportation of beet-juice in pipes. Already, a year or two ago, more than 1000 kilomètres, or 620 miles, of such pipes had been laid in France. In connection with one very large establishment at Cambrai there are 150 kilomètres, or 93 miles, radiating from the central sugar-factory to 25 stations in the surrounding country where the beets are grown, and through these pipes the juice from 250,000 tons of roots is annually transmitted. Each station is furnished simply with the rasping machinery for reducing the beets to pulp, presses for extracting the juice, and tanks to contain it, where it is mixed with about 1 per cent. of lime, and, at particular hours for the several stations, sent through the pipes by pumps, and received in the tanks of the central factory, to be measured, and its contents of sugar and foreign substances ascertained.

Of sugar-making machinery, the mills for obtaining juice by expression first demand notice. The general features of cane-mills have become pretty fairly fixed. Three massive horizontal rollers of cast-iron, the axes of two of them in the same plane, the third roller above and between these, are almost universally in use in all the larger sugar-houses. Five-roller mills are occasionally to be met with; but it is doubtful whether their greater cost and the increased liability to breaking down, with greater difficulty of access to all the parts for repairs, do not more than balance the somewhat larger yield of juice obtained by the repeated squeezing of the bagasse before it is delivered. The chief directions of improvement look to judicious distribution of the strength of the various parts, detailed precautions in favor of equalization of pressure and avoidance of choking, thoroughly good material, and sound, careful workmanship. One of the most serious drawbacks to the use of the mill arises from the heavy loss which may be suffered from a break-down in the midst of the rolling season, causing complete disorganization of the work of the sugar-house and injury to cut cane, and more or less to fresh and partially-manufactured juice. The parts of the mill are, moreover, necessarily so heavy that repairs cannot be made without much loss of time, sometimes not at all upon the spot. Hence the very first requirement of the planter is that what work his mill can do it may be relied upon to carry on for weeks without accident or delay.

A very excellent cane-mill of large size was exhibited in motion at Philadelphia, driven by its own steam-engine, by the makers, Messrs.

Mirrlees, Tait, & Watson, of Glasgow, Scotland. It presented several points worthy of careful examination. The engine had a steam-cylinder of 24-inch diameter, with 4 feet 6 inches stroke, working to about 130 or 140 horse-power, making about 35 strokes per minute. The large spur-wheel for transmitting the power to the mill was 16 feet in diameter, with a 15-inch face, and a pitch of 5 inches. The arms were tubular in cross-section, strengthened by four projecting ribs along the whole length at the ends of two diameters at right angles to each other. The toothed rim, similarly strengthened on the inside, was cast in short segments to facilitate transportation in a rough country and to make replacement easy in case of breakage of any of the teeth. The pinions of the rollers were 36 inches in diameter, and  $6\frac{1}{4}$  inches pitch. Due care had been bestowed upon making the teeth true, with full bearing on each other over the whole width. The rollers themselves were 36 inches in diameter by 84 inches long, and their surface speed was intended to be about 16 feet per minute. A valuable feature of the mill was a well-contrived horizontal opening in the main frame, allowing of a lower roller being taken out and replaced with scarcely any lifting of its great weight. The two lower rollers were placed more than usually close together, diminishing the tendency to fracture of the cheeks by lateral strain, and diminishing the tendency to choke by the sagging of the bagasse. A scraping-knife to keep clear the surface of the roller was attached to a movable cheek-piece instead of to the main frame, thus preserving the distance from the face of the roller always the same. It was stated that with this mill 300 tons of cane can be crushed per working day of 10 hours. While there was no attempt at showy finish, the workmanship throughout appeared to be thoroughly sound and substantial. The same firm also exhibited a miniature sugar-mill of economical character, for work upon a small scale. The engine, which formed an essential part of the machine, was of about 8 horse-power, and the rolls, 12 inches in diameter by 18 inches long, had a surface speed of about 20 feet per minute. This little mill was intended to crush 7 or 8 tons of cane per day (10 hours).

The Blymyer Manufacturing Company, of Cincinnati, Ohio,—a company occupied specially with the construction of machinery for sorghum-sugar production,—exhibited several mills of different sizes, though none in motion. The largest had rollers of 20 inches in diameter by 30 inches long, and was fitted with engine, gearing, cane-carriers, etc. There was a smaller mill with three rollers, and one with but two, both intended to be worked by horse-power, and the latter rendered capable of being moved from place to place by being mounted

on wheels. There were also two other small mills, for horse-power, with vertical rollers. The vertical position of the rollers is objectionable as regards the feeding of the cane, but in these small mills gives an opportunity for direct application of the power from a horizontal sweep, to the ends of which the animals are harnessed, and driven round a circle of which the mill is the centre. The difficulty as to feed is in some measure guarded against by a sort of horizontal hopper or "feed-box," which serves to guide the cane as it goes in. It must still, however, be supplied by hand.

The Peekskill Manufacturing Company (Joseph H. Adams & Son, of New York) also contributed four small crushing-mills for sorghum or cane, to be fed by hand. They were fairly strong and well made and simple in construction, but involved no special point of interest.

There were no presses exhibited intended for the treatment of beet-pulp. In Germany there has been a tendency to substitute for the presses hitherto chiefly used modified systems of rollers, giving continuous delivery. In most of these the pulp is carried forward on a web or apron, upon which it is evenly spread.

Apparatus for diffusion was represented by a model of an arrangement proposed (but apparently not as yet tested in practice) by Mr. G. Bouscaren, of Cincinnati, Ohio, the model itself being neatly finished, in brass, to a scale of one-twelfth the real size intended; but the design, while displaying a good deal of ingenuity in some of its details, involves excessive and needless complexity of parts, and some serious defects of principle. Thus, instead of utilizing hydrostatic pressure as the simple means of transferring the contents of one vessel to another, the twelve vessels themselves—cylinders of 4 feet in diameter and 6 feet high, full of cane-slices and water—are to be raised gradually one above another by rotating bodily a huge annular frame on which they rest, the top of this frame being shaped into two segments of helices, forming a continuous track inclined in two opposite directions in different parts of its circumference. This idea entails the construction of a number of the pipes for water and steam in sections telescoping into one another, so as to close up or lengthen out as the vessels rise or descend again. The elaborate stirring apparatus provided for the interior of each cylinder could only be made to work by using so large a quantity of water as either to require a number of diffusion vessels much greater than that intended, or to furnish far too weak a liquid for boiling down with profit.

The Julius Robert diffusion apparatus, originally designed for

work with sliced beet-root, underwent some modifications when first applied to sugar-cane at Aska in India, but its details were found to require still further alteration when, with far dearer labor, it came to be tried in Louisiana. The point demanding special attention turned out to be the mode of filling and emptying the diffusion vessels. The apparatus and machinery, as successfully modified by Mr. A. Mitchell, of the firm of Leeds & Co., of New Orleans, by which firm the plant was erected with which the results mentioned above were obtained, consists of the following parts:

**ENGINE.**—One horizontal steam-engine, of 45 horse-power, to drive the cane-cutters and operate the various cane-carriers.

**CANE-CUTTERS.**—There are four of these, each consisting of a vertical revolving disk of cast-iron, 4 feet 6 inches in diameter, on which are fastened six (or eight) bars, radiating from the centre, each bearing two knives ground to an edge like that of a plane-iron. These knives in their rotation pass rapidly and in close proximity to another knife fixed horizontally near the disk. The canes are cut into slices as they are fed against the disks or knives by means of a sloping hopper. The thickness of the slices is regulated by the distance between the knives on the disk and the fixed knife.

The knives can be readily removed for the purpose of cleaning and sharpening them, and as each disk moves independently of the others only one cutter need be stopped at a time, so that the work of slicing the cane goes on uninterruptedly. A set of knives may run for 24 hours before requiring to be sharpened, but 10 or 12 hours is about the usual time; and in the case of very tough, fibrous cane, as two-year old ratoon, sharpening may even be required after 3 or 4 hours. In any event, it takes but a few minutes to remove the dull knives and replace them with others kept in reserve.

The cane slides through the hopper so as to strike the plane of the revolving disk at a suitable angle, in order to produce such chips as will expose a large number of the central cells to the action of the liquid in the diffusion vessels.

Those cane-cutters, invented by Franz Řebiček, of Vienna, make about 220 or 225 revolutions per minute, and produce a clean, sharp slice, of oval shape, 3 or 4 inches long, of a width equal to the diameter of the cane, and from  $\frac{1}{8}$  to  $\frac{1}{4}$  inch thick. Each cutter is capable of reducing to chips about 6000 pounds of cane per hour.

**DIFFUSION VESSELS.**—These are made of light boiler-plate as far as the upper, cylindrical portion goes, the lower or bottom piece being made of cast-iron. The upper part is about 4 feet in diameter and 8 feet high. The lower piece is cut off on the rear side by a

plane inclined at an angle of  $45^{\circ}$ , so as to aid in throwing the exhausted chips forward to the vertical door or man-hole by which they are removed.

The mass of chips becomes so packed in the vessel as to require this discharge-door to be made very large,—it leaves a clear opening of 4 feet square. Whereas formerly, with a discharge-aperture of 20 inches square, the time occupied in emptying each vessel was from half to three-quarters of an hour, employing four to six hands; with the large discharge-door, opening on a hinge, and secured by specially-designed clamps and set-screws, two men were able to open the door, empty the vessel, and re-fasten the door in from 6 to 8 minutes. Formerly the filling took 25 minutes; with the improved vessels one man can fill in 12 minutes. As packing round the door, soft wood (*Rhus copalinum* usually) was found to answer better than india-rubber.

Each diffusion vessel has a capacity of 120 cubic feet, and receives a charge of about 4000 pounds of cane-chips and 3250 pounds of water. Ten of these vessels form the complete battery; but in the event of one, or even two, of them becoming disabled, these may be thrown out for repairs, and work carried on with the remainder without more than a few minutes' interruption,—one great advantage of the process.

Each vessel is in connection with five pipes: one for water from the tank above; one to send juice to the heater; one to receive juice from the heater; one to discharge juice into the sugar-house to the clarifying-pans; one to convey juice from one vessel to another. Beside these there is one pipe direct from the boiler to supply steam, and one large waste-pipe to discharge the water from the vessel before emptying the exhausted chips.

Each vessel has a man-hole at the top for introducing the chips, capable of being closed and firmly clamped, as well as the large man-hole at the bottom, for emptying chips, as already mentioned. The concentrated juice sent into the sugar-house is drawn from the bottom of the vessel, and to prevent chips passing with the juice each vessel is provided with a false bottom, perforated like a sieve.

**HEATER.**—This vessel is made of boiler-plate, and is in direct communication with the steam-boiler. It serves to heat the juice in its passage from one diffusion vessel to another. The juice passes through a system of copper pipes fixed vertically in the heater, which are completely surrounded by steam from the boiler. The temperature of the juice is indicated by a thermometer inserted in the top.

**WATER-TANK.**—Hydrostatic pressure alone is used in passing juice from one vessel to another, as well as through the heater and into the

sugar-house, and this is obtained by a water-tank of 1500 gallons capacity, placed about 20 feet above the diffusion vessels, and connected with them by a large copper pipe. This method has not only the advantage of simplicity and convenience, but obviates the necessity of exposing the cane-chips to contact with air from the moment they are first covered with water until they are discharged exhausted of sugar.

The general distribution of the apparatus and its connections is illustrated by the accompanying figures,\*—1 to 8 inclusive.

Fig. 1 is a general ground-plan of the buildings, which were two in number, placed at right angles to each other; the one containing the engine and cane-cutters, the other the diffusion vessels. A portion of the plan of the diffusion-house is on the level of the second floor.

*i* represents the position of the steam-engine and main driving-wheels. *c* is the shaft transmitting power to the cane-cutters. *a, a, a, a*, are the carriers conveying whole cane to the cutters; *b, b, b, b*, the cane-cutters themselves. *d* is a carrier conveying the cane-chips to the second story of the diffusion-house. *e* is a movable carrier, which receives the cane-chips from *d*, and, traversing from end to end of the series of diffusion vessels, delivers the material to the top of any one of them as required. *f, f*, are the diffusion cylinders themselves. *l* is the large water-tank supplying the whole series of vessels; *m*, the pipe leading from the tank to the vessels; *k*, the heater.

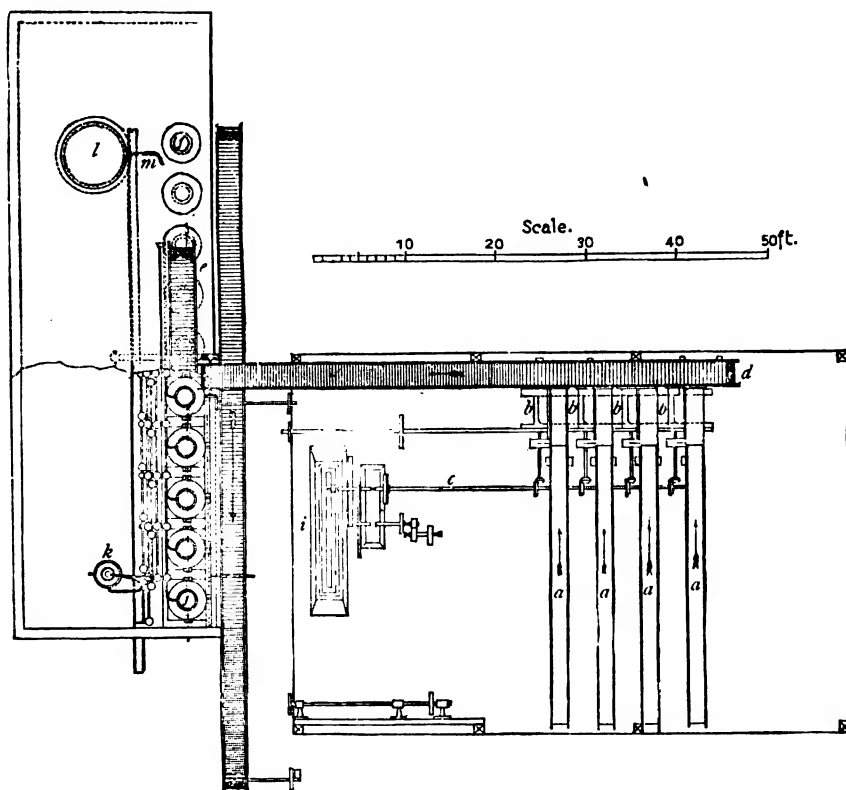
Fig. 2. (*A*) is a longitudinal elevation of the diffusion-house, with (*B*) a cross-section of the cane-house. In this, *e* is the movable carrier supplying cane-chips to diffusion vessels. *f, f*, are the diffusion vessels; *g, g*, the discharge-doors for emptying chips; *h*, the bagasse carrier, to remove the exhausted chips as discharged; *d*, the carrier conveying cane-chips from cutters to *e*; *a*, carrier supplying whole cane to cutters; *v, v*, driving-belts (or, rather, chains).

Fig. 3 is a longitudinal section of the diffusion-house. *e* is the movable carrier, as before; *f*, diffusion vessels; *g*, discharge-doors of vessels; *h*, bagasse carrier; *l*, water-tank.

Fig. 4 (*C*) is a cross-section of the diffusion-house, with (*D*) a longitudinal section of the cane-house; *l* is the water-tank; *e*, the movable carrier for cane-chips; *f*, diffusion vessel; *k*, heater; *s*, pipe carrying juice from battery to heater; *n*, pipe conveying warmed juice from heater to battery; *s*, steam-pipe; *u*, waste-pipe to discharge water in emptying diffusion vessels; *g*, discharge-door for exhausted chips; *h*, bagasse carrier; *v*, driving-pulleys; *i*, steam-engine; *c*, shaft to cane-

\* Taken, with most of the above description, from Kollmann's report, above quoted.

FIG. 1.



DIFFUSION PROCESS FOR SUGAR FROM CANE.

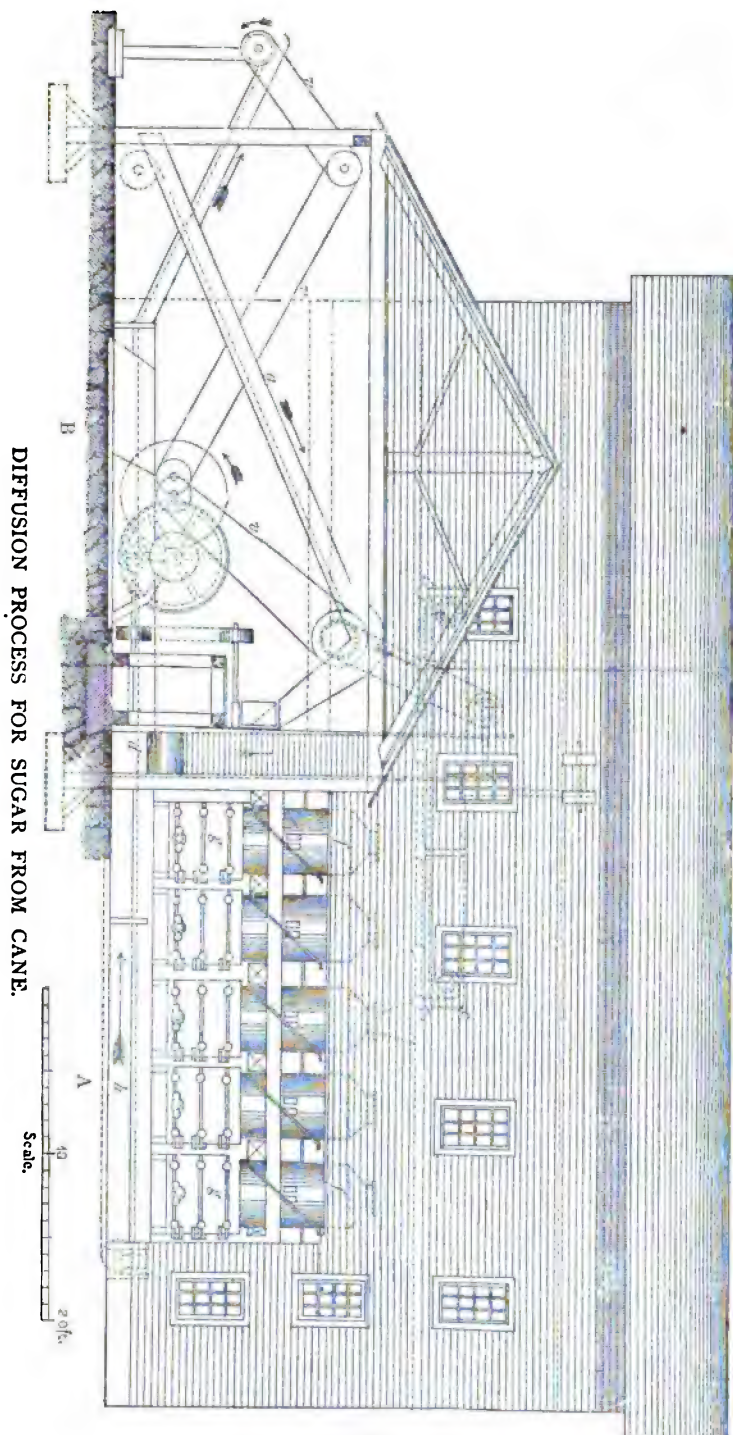
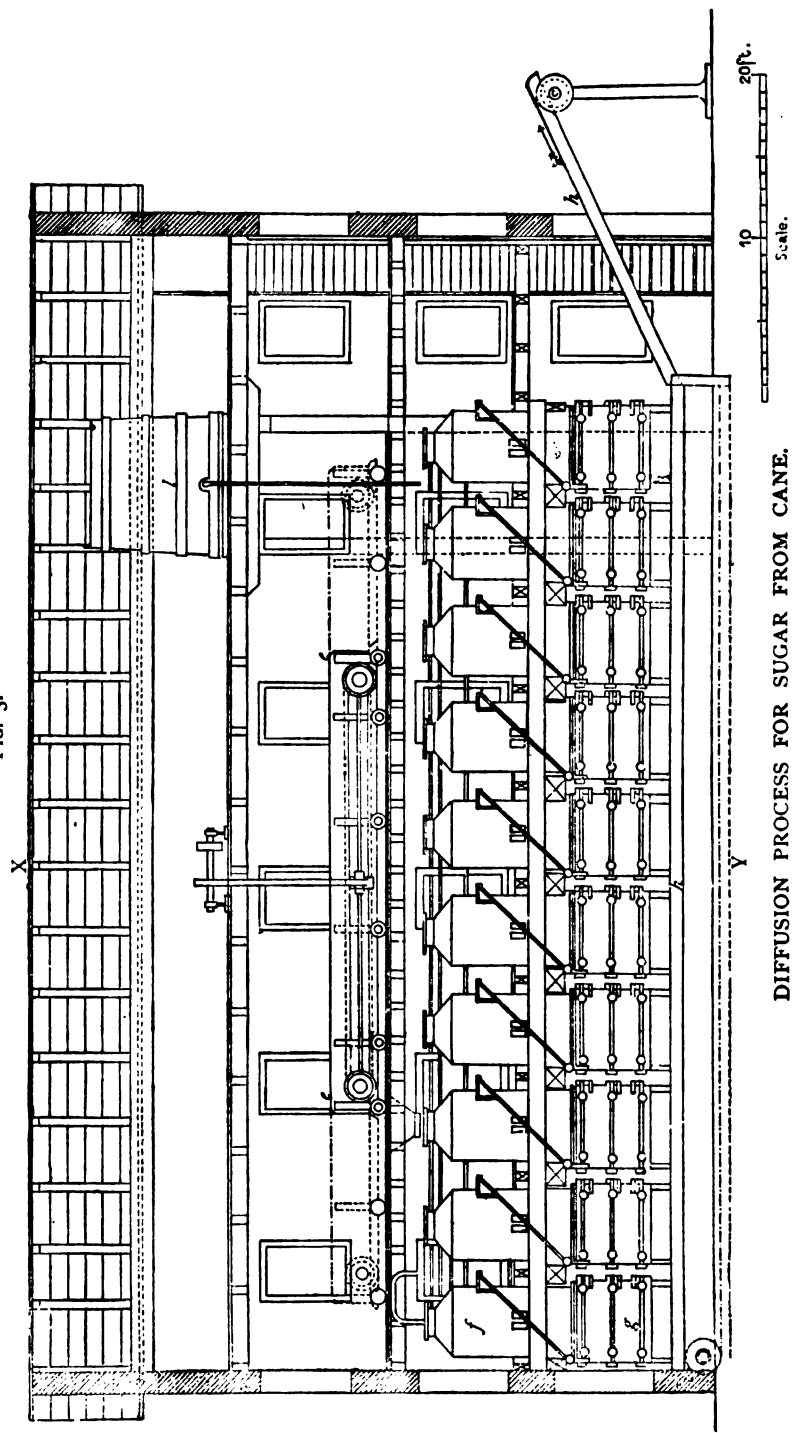




FIG. 3.



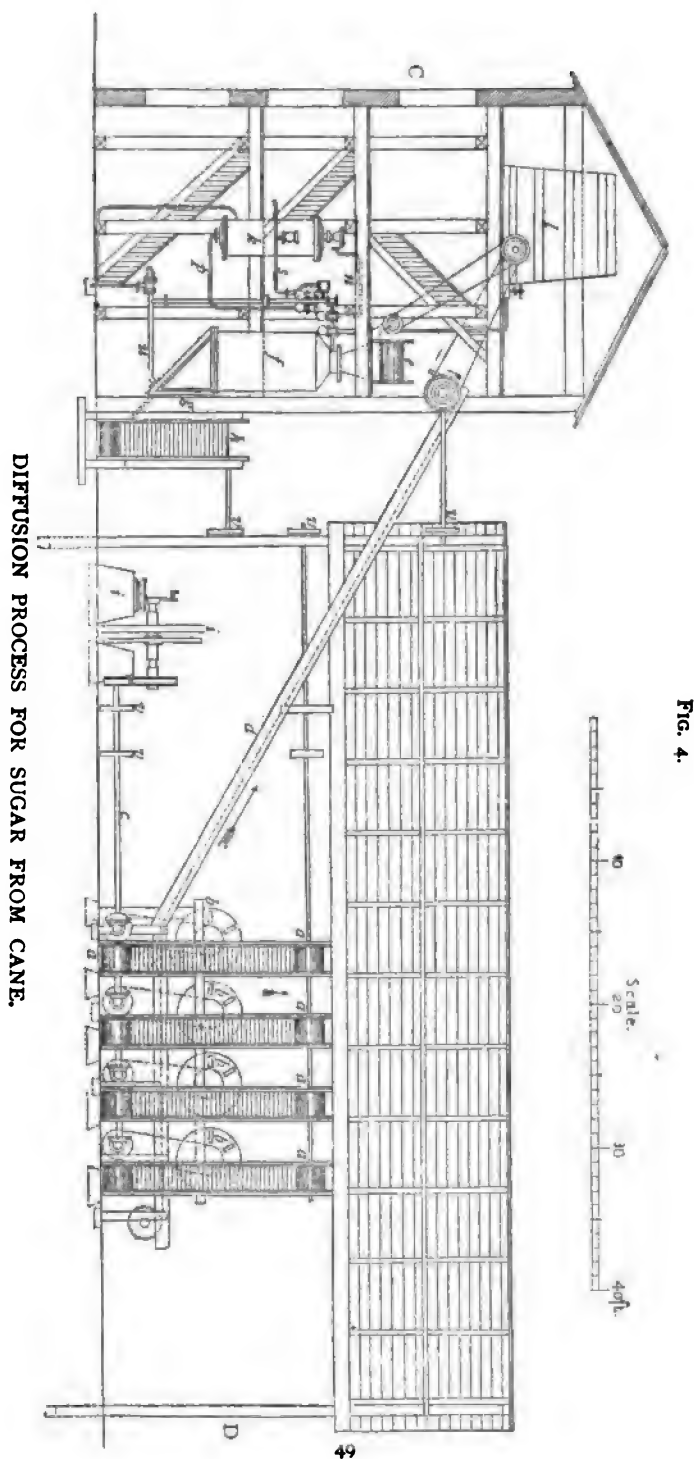
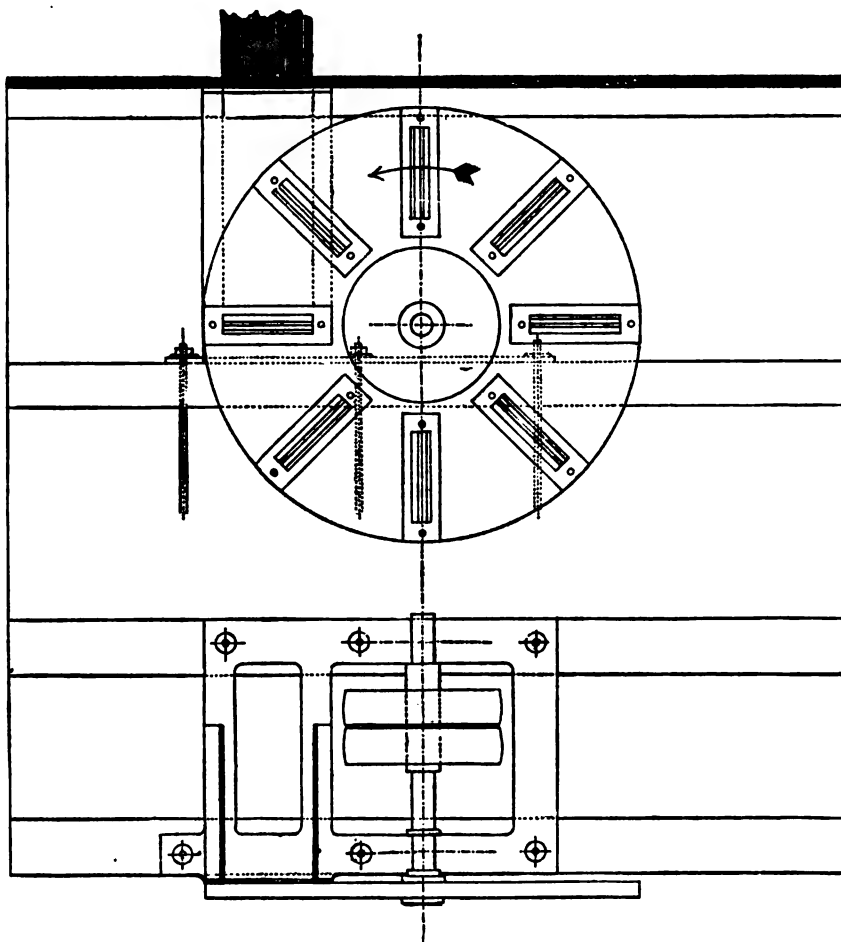
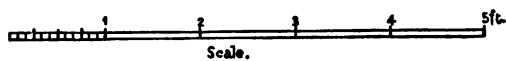


FIG. 5.



CUTTING MACHINE FOR SLICING CANE.



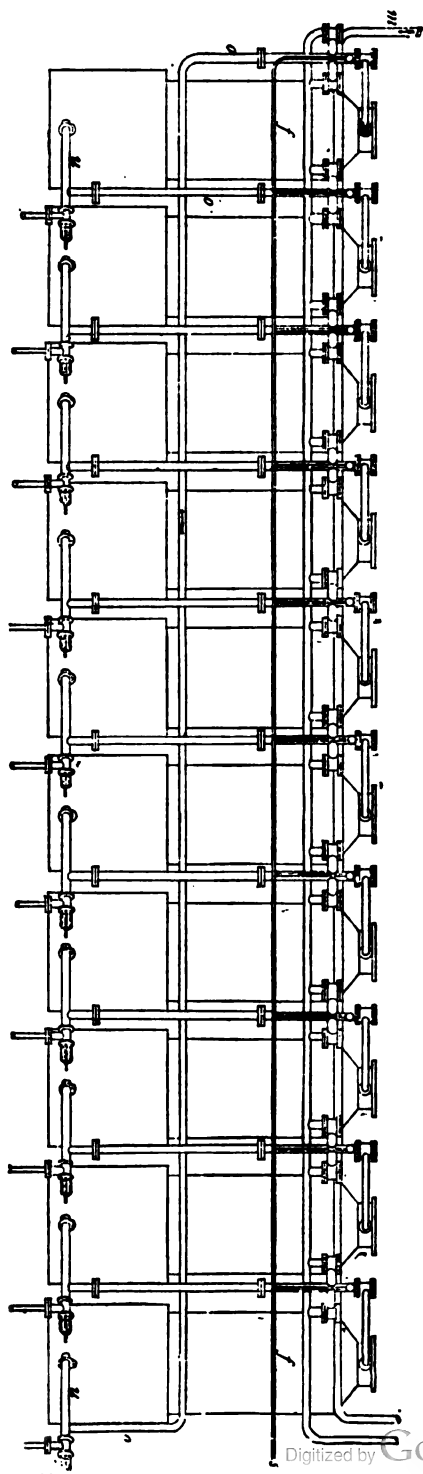
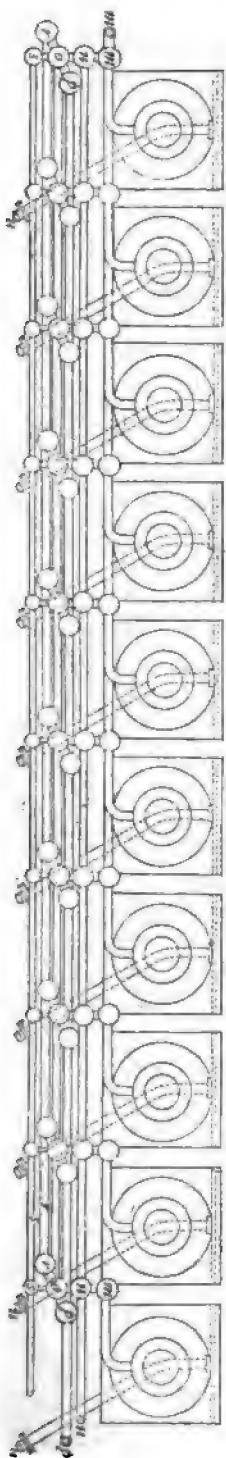


FIG. 6.

Scale. 0 20 30 40ft.

FIG. 7.



DIFFUSION PROCESS FOR SUGAR FROM CANE.

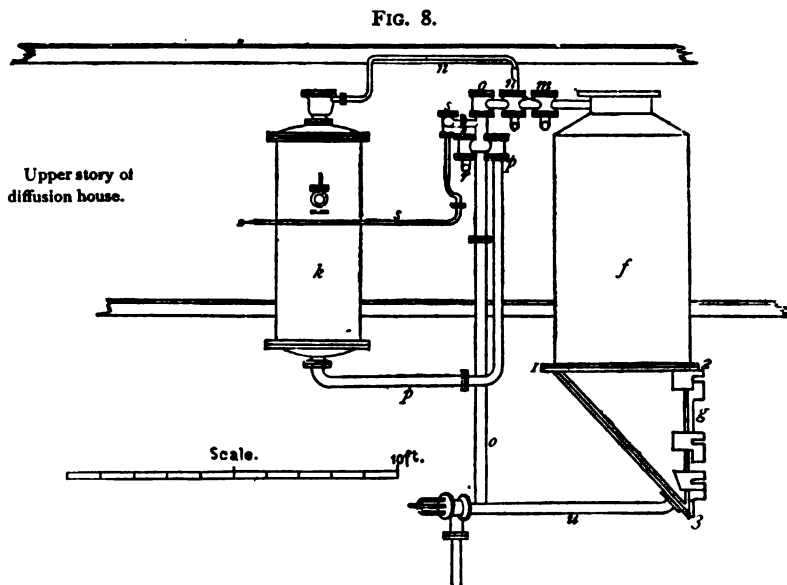
cutters; *a*, carriers to supply cane to cutters; *b*, cane-cutters; *d*, carrier to convey chips from cutters to *e*.

Fig. 5 represents the essential parts of the cane-cutting machines as originally designed; six knife-bars to each were, however, afterwards used, instead of eight, and the size of the cast-iron disk somewhat increased.

Fig. 6 is a longitudinal elevation from the rear of the diffusion battery; *f, f*, the diffusion vessels; *m*, pipe from water-tank; *s*, steam-pipe; *o*, overflow-pipe; *u*, waste-pipe.

Fig. 7 is a plan of the diffusion battery; *m*, pipe from water-tank; *p*, pipe to carry juice from battery to heater; *n*, pipe to carry warmed juice from heater to battery; *s*, steam-pipe; *r*, pipe to carry concentrated juice to sugar-house; *o*, overflow-pipe; *u*, waste-pipe.

Fig. 8 is a cross-section of the diffusion battery; *f*, diffusion vessel;

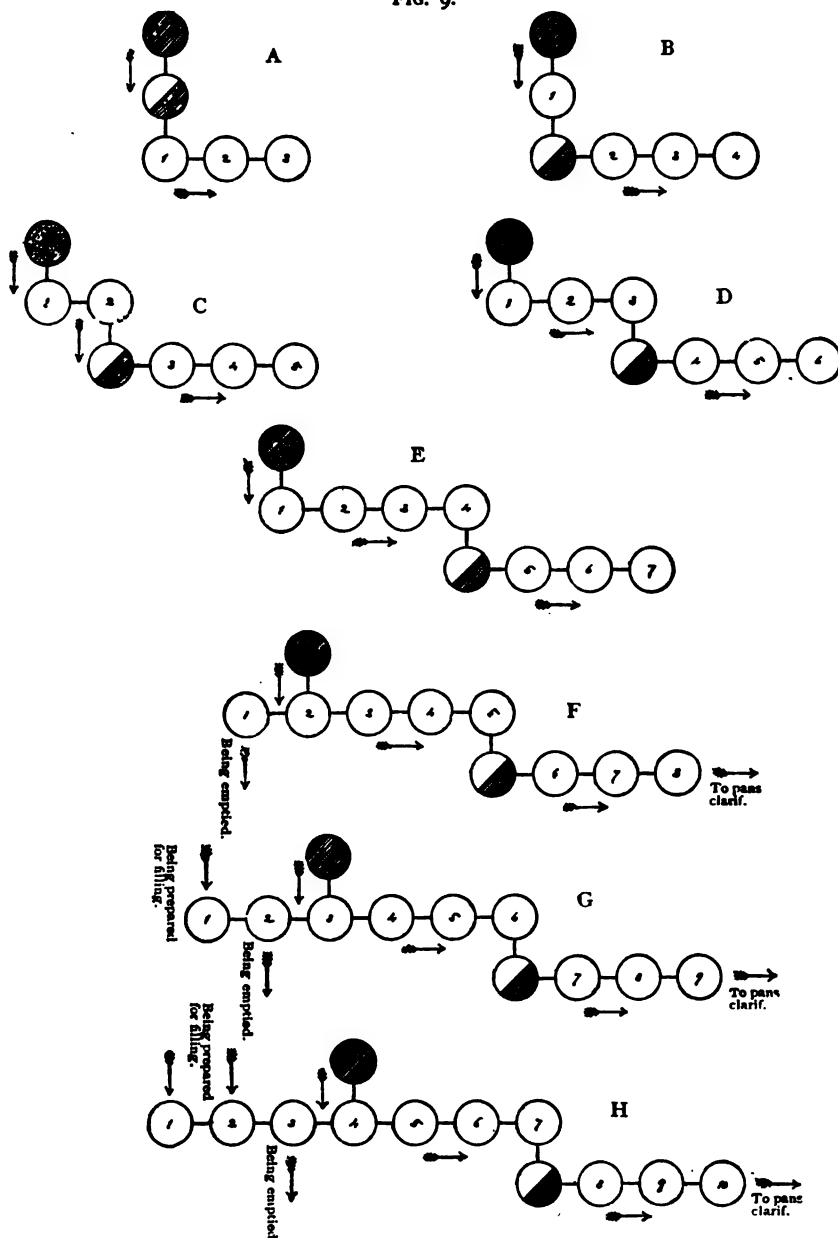


DIFFUSION PROCESS FOR SUGAR FROM CANE.

1, 2, 3, cast-iron bottom piece of diffusion vessel; *g*, discharge-door of diffusion vessel, and remaining lettering as before.

Fig. 9 is a simple set of diagrams showing the order in which the water for diffusion is passed through the vessels of the battery. In each diagram the shaded circle represents the water-tank, the half

FIG. 9.



DIFFUSION PROCESS FOR SUGAR FROM CANE.

shaded the heater, and the numbered circles the diffusion vessels of the battery.\*

To work the above apparatus, eight or nine men and two boys were required, viz.:

One man to sharpen knives; two men to fill up diffusion vessels; two or three men to empty and clean them; one man to attend to valves in diffusion battery; one boy to look to feeding of cane to cutters; one boy to help at the battery, watch heater, etc.; two men and carts to haul away bagasse.

The next class of apparatus to be mentioned is that intended for the evaporation of the juice, naturally divisible into open pans, or those in which evaporation is carried on under the usual pressure of the atmosphere, and vacuum-pans, or those in which this pressure is reduced.

It is a pity that Fryer's "concretor," above alluded to,—probably the most efficient and practically useful contrivance for rapid evaporation of crude juice in the air,—was not exhibited among the English machinery, even by a model. Although invented and described several years ago, it seems to be less generally known than it deserves.

The apparatus consists of three parts: 1st, a rectangular pan of cast-iron, made in sections, and in all 25 or 30 feet long by 6 feet wide and 6 inches deep, with a number of partitions running across, extending alternately from each side nearly to the other, and set with a slight inclination,—so that the juice runs in at one end, and, in a stratum of not more than half an inch in depth, by a long, zigzag course, escapes at the other. The pan is heated by direct fire from below, and in passing through it about two-thirds of the water is evaporated. The juice, now of syrupy consistence, goes thence to the interior of a hollow cylinder of sheet-copper, heated on the outside by the flue gases from the fire under the pan (or by the vapor from the juice therein), while through the inside a current of air is driven, heated by the exhaust steam of the small engine which furnishes power. This cylinder is 20 feet long by 3 feet 6 inches in diameter, open at the ends, with the exception of a little rim to retain the syrup, set with a slight inclination from the horizontal, and made to revolve slowly—about 6 or 8 times per minute—on its axis. Thence the syrup, now of thick consistence, passes to the exterior surface of a copper-faced iron cylinder of 4 feet in diameter by 4 feet long, over which it is evenly distributed in a thin layer. This cylinder is heated from within

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\* I have devoted so much space to description in detail of this diffusion apparatus, and the method of working it, because of the very high degree of importance which I believe it possesses for the future interests of the sugar-planters of Louisiana.

by exhaust steam, revolves upon its axis twice per minute, and receives on the outside a steady blast of heated air, by which the evaporation is rapidly completed and the syrup brought to the consistence of a soft solid, which is removed by a scraper, and can be moulded while warm, but on cooling sets into perfectly hard slabs, ready for storage or shipment. The time required for the passage of any given portion of sugar from end to end of the whole apparatus is only about 15 minutes, and with the above dimensions of parts the product is said to be about half a ton of "concrete" per hour. Of course the arrangement may be used to produce crystallized sugar, but it is specially adapted to its intended use of rapidly putting the crude juice into a condition in which it may be kept free from alteration and in small bulk for shipment, to go in due time into the hands of the refiner.

The same principles as those involved in the "concretor" were in part illustrated at Philadelphia by one or two exhibits. Thus, among the machinery for sorghum syrup-making of the Blymyer Manufacturing Company, of Cincinnati, Ohio, was a rectangular sheet-iron pan, with cross partitions and alternate openings at either side for passage of the juice, mounted upon rockers, so as to admit of adjustment of inclination, and having a portable furnace forming a part of the structure underneath. The sides of the pan were made to extend beyond the

FIG. 10.



COOK'S EVAPORATOR, WITH PORTABLE FURNACE, FOR SORGHUM.

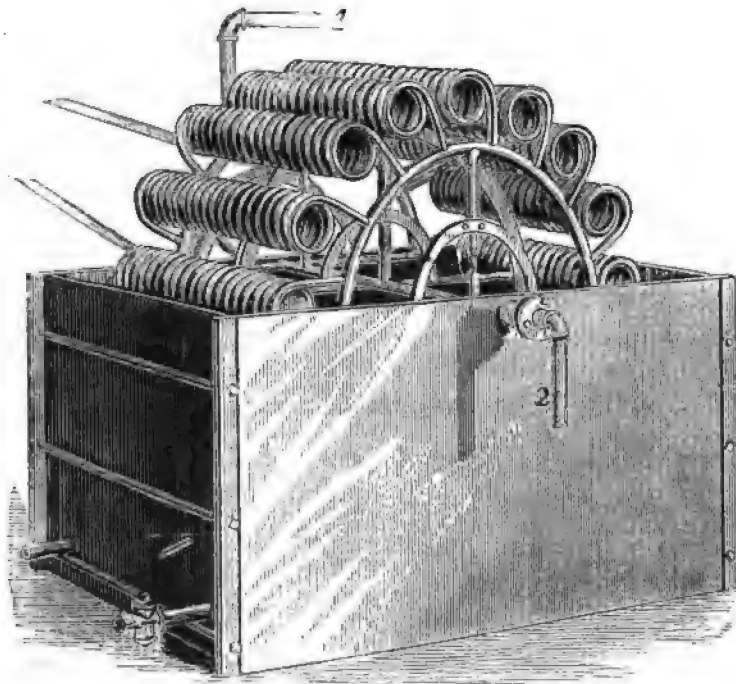
fire-line of the furnace, so as to give a cooling surface for the collection of scum. This pan, called "Cook's evaporator," is said to have been made and sold in large numbers for the treatment of sorghum-juice. Its proportions are shown in Figure 10. Stationary pans of the same



sort and of larger size, to be set on brick furnaces, are made by the exhibitors.

Mr. J. W. R. Schmedes, of New York, sent a model of an apparatus called the "Badoux evaporator," the construction and mode of working of which will be readily understood from Figure 11. The central axis, the arms radiating from this at each end, and the circular rims uniting each set of arms, are all hollow, and the rims of the two ends are in communication through a number of spiral coils of pipe,

FIG. 11.



1. Steam feed-pipe.

2. Exhaust pipe.

## BADOUX EVAPORATOR.

all whose axes are parallel to each other and to the central axis about which the whole system revolves. Through one end of this latter axis or trunnion steam is introduced, and at the other end discharged, passing through the coils of pipe on the way, so as to heat them. As they slowly revolve, motion being obtained from a driving-pulley on one end of the central axis, they successively dip into and rise from the liquid to be evaporated, which is placed in a trough underneath. The large surface exposed by the heated coils expedites evaporation. The temperature may be regulated by the

more or less free admission of steam. The exhaust-pipe is partitioned at each arm, so as to take off the water from three coils independently of the rest; and the trunnion is also partitioned, so that water falling from one set of coils does not fall into the others. This plan of mechanically lifting the liquid to bring it into contact with air seems less desirable than Fryer's method of, in large measure, bringing the air to the liquid, and it would be well to know from actual measurement how much power is expended in driving the system of pipe-coils. As regards the rate of work attained, the maker of several of these evaporators states that sugar liquor is evaporated from  $10^{\circ}$  to  $42^{\circ}$  B., at a temperature of  $192^{\circ}$  to  $200^{\circ}$  F., at the rate of 10 pounds of water per square foot of heating surface per hour; and a firm using the apparatus in the manufacture of glue reports that with a wheel of 5 feet in diameter and 5 feet face, the steam fed through a 1-inch pipe, the valve half open, and 12 to 16 revolutions made per minute, four gallons per minute are evaporated at a temperature ranging from  $145^{\circ}$  to  $185^{\circ}$  F. These statements would represent something like one-third the evaporative power of Fryer's convector with the dimensions given above. The coils of pipe are obviously ill adapted to the removal of very thick or semi-solid material, and therefore evaporation with this contrivance should not be carried so far as to interfere with the simple dripping off of the concentrated syrup.

The great advantage presented by evaporation under reduced pressure, in lowering the boiling-point of the liquid, and thereby diminishing the amount of "invert," or uncrystallizable sugar formed, has made the vacuum-pan in one or other of its forms a more and more important part of sugar-making apparatus. In the manufacture of beet-root sugar in Europe open pans are becoming very generally considered out of date, and the more intelligent planters of sugar-cane have been gradually discarding them and substituting vacuum arrangements. Had it not been for the calamities of war and worse than war which have afflicted Louisiana for sixteen years, a large proportion of her sugar-houses would doubtless by this time have been equipped with this improvement instead of the long list still presented of batteries of open kettles.

Under this head there was not much presented at the Exhibition.

Messrs. Colwell & Bro., of New York, contributed an 8-foot vacuum-pan, mounted upon columns, and with sections of flooring, which enabled the different parts to be gotten at and examined. The pan was of good, sound workmanship, but presented no special novelty in design. The steam-coils were, as usual now, separate rings, allowing of the use of steam in one or more independently, so as to regulate

the application of heat by the height of the syrup in the pan. The sliding-door for the discharge of the sugar seemed well designed. The vacuum-pump accompanying the pan was one purchased from the Geo. F. Blake Manufacturing Company, and did not form a part of the exhibit.

On the other hand, the Scotch firm of Mirrlees, Tait, & Watson exhibited a very good wet vacuum-pump without any corresponding pan. I regret that the representative of this firm did not feel authorized to allow me to publish a sketch which he gave me for my own information showing the internal arrangement of this pump, the performance of which, so far as it could be tested on the spot, was excellent. The general features of construction consisted of a large, hollow ram or plunger, made as a whole of about the specific gravity of water, connected with a piston-rod and working horizontally to and fro in the lower part of an inclosed chest containing water; this lower portion being divided in the middle of its length by a vertical partition, through the centre of which, in an annular gland or short section of a cylinder, the piston passed. Above the middle of this lay the suction-chamber, fitted with two valves, opening downward on opposite sides of the central partition, and drawing air, vapor, and condensed water from the pipe to be connected with the vacuum-pan. Between this suction-chamber and the ends of the pump-chest were two spaces in which air and uncondensed vapor collected, to be expelled, on the return stroke of the piston, through valves opening upwards in a horizontal partition immediately above, which partition extended over the whole area of the chest, and formed the bottom of the overflow well, in free communication with the atmosphere and with a waste-pipe for discharged water. The piston-rod passed through a stuffing-box, but the piston or plunger was without packing, working with brass surface directly upon brass.

There was no illustration of that which has constituted the most important improvement of late years in vacuum-pans, especially for first boiling, namely, the passage of the vapor from the juice or syrup in one pan through the heating-spaces of the next, utilizing the higher temperature of the vapor first produced with little or no reduction of pressure to boil the juice in the second pan with a better vacuum, and the vapor here formed to produce boiling in a third pan with still lower pressure. This idea gave value to the older Rillieux pans *à double et à triple effet*, and is still better applied in the more modern Robert series of pans with progressively increasing vacuum.

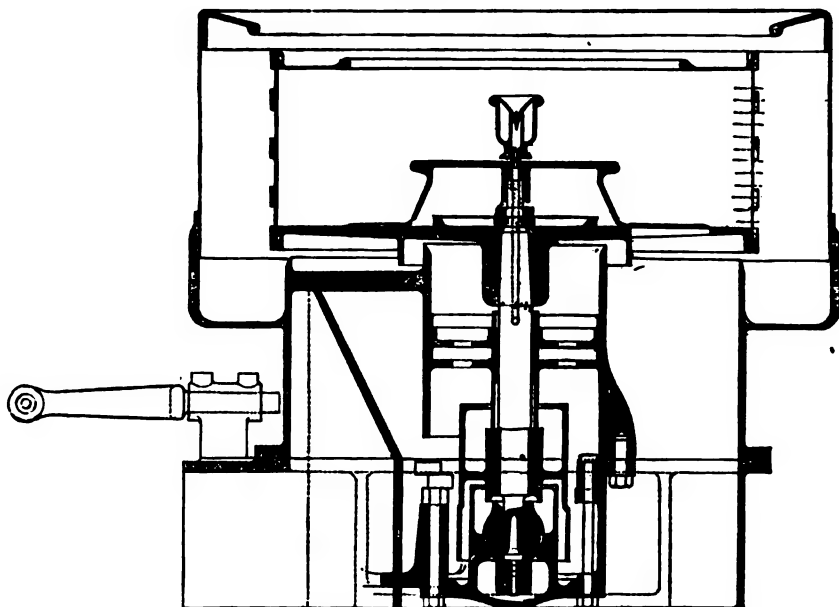
In connection with the direct production of sugar from cane-juice, I believe that improvements in the arrangements for evaporation might

probably still be made in two directions: 1st, the increase of evaporating, as distinguished from heating, surface in the body of at least the first pan, where the existence of but slightly reduced pressure would entail no difficulty on the score of strength in greatly modifying the shape of flat, horizontal pans; the object being to diminish or do away with turbulent boiling and replace it by surface evaporation at a sufficiently rapid rate, though in a closed vessel; 2d, the attempt to interpose between the mill, or still better the diffusion battery, and the first evaporating-pan, and again between this and the succeeding pans, closed filters through which the juice should be drawn or forced, so as to provide in the first instance for removing suspended impurities by passage through strainers, like those of modern filter-presses, thus replacing the now usual skimming, and in the second place for further purification by passage through animal charcoal; the object being to absolutely remove the juice from contact with the air from the moment of its entrance at one end of the apparatus to its withdrawal at the other end as crystallizable or partially crystallized sugar. While the mischief resulting from needlessly-prolonged heating, too high a temperature, and any acidity of the juice, is fully recognized, it may be doubted whether the effect upon cane-sugar in heated solution of free contact with the air has received sufficient consideration. If such an arrangement as that suggested should be found advantageous, there would be little difficulty in contriving means in detail for rapidly diverting the juice through fresh closed filters as others became clogged and required cleaning.

The last important class of mechanical appliances to be noticed is that of centrifugal machines for the drainage of crystallized sugar. This method of removing molasses or syrup is one now in very common use, and has in no small measure replaced the older process of drainage by gravity. Of these machines there were three exhibits.

Along with the vacuum-pan of Colwell & Bro. was placed a set of four centrifugals, with the usual accompanying mixer to break up lumps in the sugar mass before delivering to the machines, consisting of an overhead trough and set of revolving knives. The principal parts of the centrifugal machine itself are shown in Fig. 12 (page 60), which is a vertical section. The brake for arresting motion is applied at the expanded portion at bottom of small driving-pulley, at a level with the lower bearing of spindle, and is worked by a powerful knuckle-joint. The arrangements for oiling the bearing surface of the spindle will be seen from the figure. The basket is 36 inches in diameter, and has a clear space of about  $5\frac{1}{2}$  inches all round, between it and the

FIG. 12.

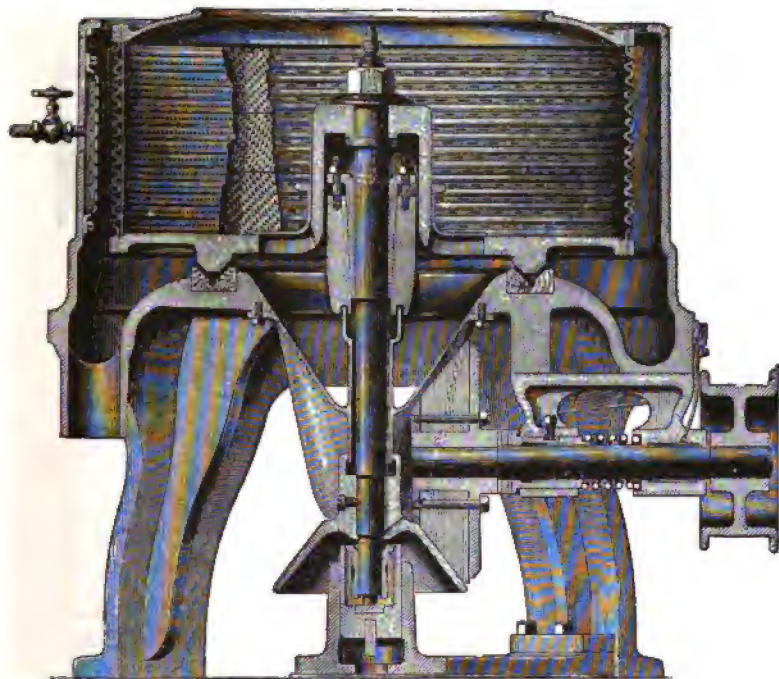


HEPWORTH'S CENTRIFUGAL MACHINE.

inclosing casing, to receive molasses. The openings in the bottom of the basket for discharge of sugar are quite large, and placed nearer the circumference than usual, enabling the contents of the basket to be easily removed.

H. W. & R. Lafferty, of Gloucester, New Jersey, exhibited a set of four 30-inch centrifugals, with mixer to reduce lumps, frame, gearing, and a recently-patented screw-elevator, to raise the sugar mass (slushy mixture of sugar and molasses) from the coolers to the mixer. Fig. 13 (A and B) gives a vertical section and an outside elevation of one of

FIG. 13, A.



LAFFERTY'S CENTRIFUGAL SUGAR-DRAINING MACHINE.

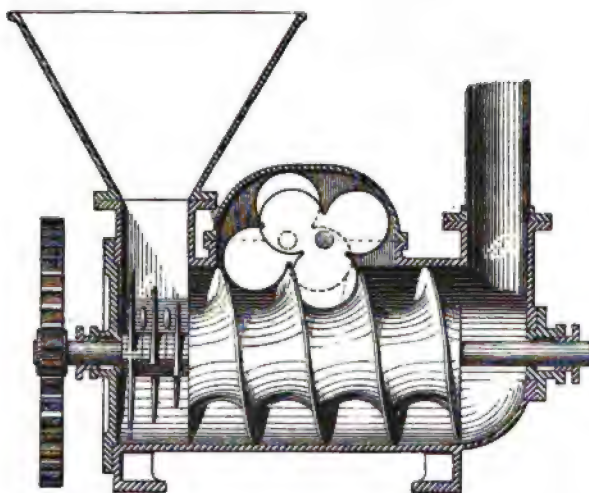
the centrifugals. The power is transmitted from the outside pulley and shaft by a pair of driving friction-cones, one of which is faced with vulcanized rubber. The arrangement for dropping the lower end of the spindle and its bearing in order to separate the cones and allow of the basket being brought to rest by friction will be rendered intelligible by the figures. The basket is made of copper, and the sides are corrugated, to provide channels for free egress of the syrup. The fine wire-gauze sieve inside is supported by a second web of coarser and stronger gauze. The inventor claims that this corrugation causes so much easier escape of the syrup than from baskets with

FIG. 13, B.



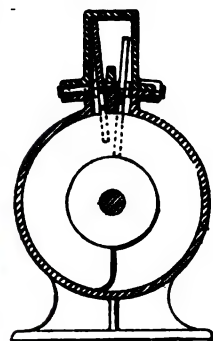
LAFFERTY'S CENTRIFUGAL SUGAR-DRAINING MACHINE.

FIG. 14, A.



LAFFERTY'S SCREW ELEVATOR FOR SUGAR MASS.

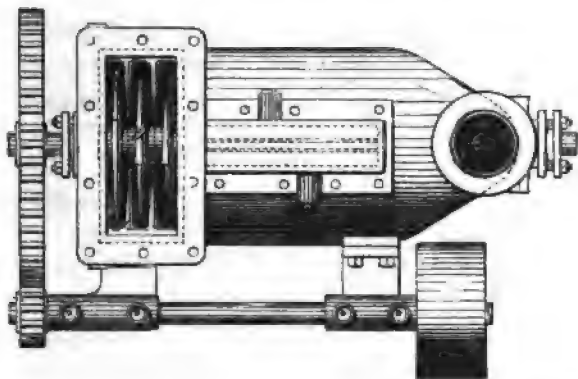
FIG. 14, B.



smooth, vertical sides, that equally good drainage is obtained with one-third less speed, and a smaller amount of fine-grained sugar forced through with the molasses. The sugar is discharged from the basket of this machine through a conical hopper surrounding the central spindle.

Fig. 14 (A, B, and C) shows the construction of the screw-elevator, which was exhibited at work, as used for raising the undrained sugar to the mixing trough, whence it is let down into the centrifugals. A

FIG. 14, C.



LAFFERTY'S SCREW ELEVATOR FOR SUGAR MASS.

is a vertical section, showing the peculiar form of valves used to prevent the sugar mass receding; B is a transverse section through these valves; and C is a view in plan, with the feeding-hopper removed, showing the mode of applying power.

Mirrlees, Tait, & Watson, of Glasgow, included in their valuable exhibit of sugar-making machinery a pair of 30-inch centrifugal machines, with mixer, and a single 18-inch machine,—all of these of Weston's excellent patent, embracing some specially noteworthy features. Each machine (called "self-balancing") has but a single bearing so supported by india-rubber washers that the basket, when the weight of its contents is not equally distributed about its centre, may, in revolving, oscillate within certain limits until it settles down to steady rotation about a line passing through its centre of gravity, thus diminishing vibration, consumption of power, and wear and tear. The special form of friction-pulley used to gradually apply the motive-power and bring up the speed is very ingenious and effective, and the brake arrangement for stopping the motion, as well as the provision for lubrication, is also deserving of attention.

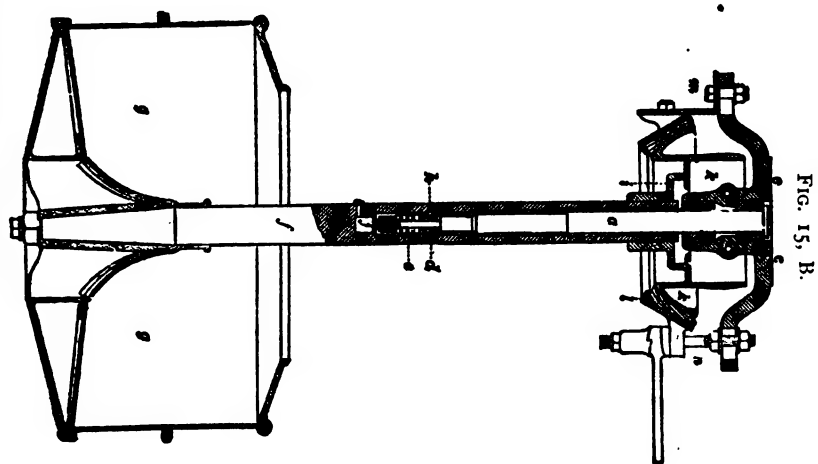
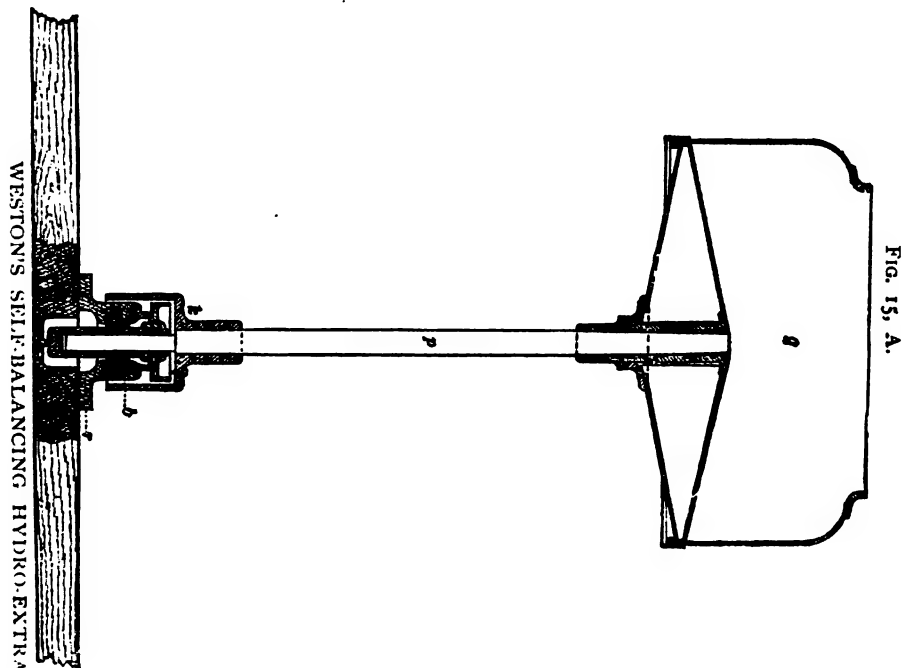
The bearing may be below, the basket supported above it on the head of the spindle; or the bearing may be at the upper end of the



spindle, and the basket hung beneath. The former arrangement (known as the "pivot" form) was illustrated by the single small machine, and the latter (the "suspended" form) was that of the two large machines. The latter arrangement seems, under ordinary circumstances, the more important, and for sugar-making to be preferred.

Fig. 15 (A and B) illustrates by vertical section the construction of both forms of machine, save that the openings for discharging the sugar are not shown, and in A (pivot form) the brake is not represented. In A, *g* is the basket placed on the upper end of the spindle *p*, the lower end of which rests in a bush *q*, secured in the block *r* between two india-rubber washers *b*, which permit the basket to oscillate sufficiently to balance itself. The pulley *k* is placed at the centre of the elastic bearing, and also forms the surface against which the brake acts.

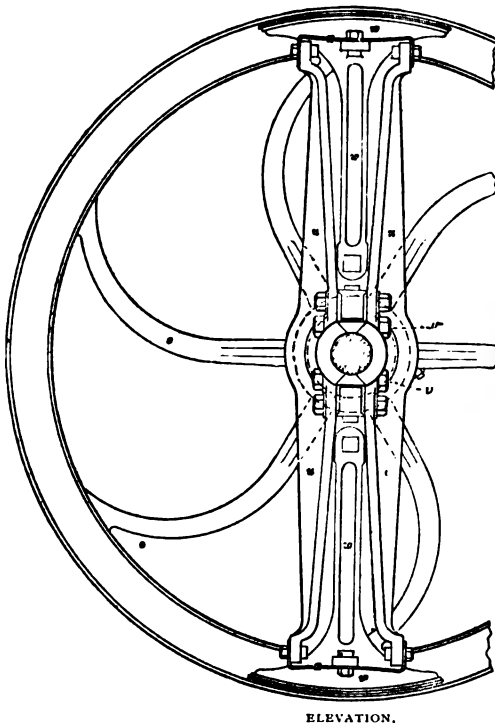
The suspended machine (B) will be seen to consist of an inner spindle *a*, having at its upper end two strong india-rubber washers *b*, *b*, by which it is secured in a suspending block *c*, and grasped so as to prevent the spindle turning round, but at the same time allowing it to vibrate within the limits of the elasticity of the rubber washers. This inner spindle, fitted at its lower end with a brass bush *d*, and a set of anti-friction steel washers *e*, supports an outer spindle *f*, which is free to revolve upon it. The basket *g*, made of steel in the machines exhibited, but sometimes also of copper, is secured to the lower end of the outer spindle, and the bottom of the basket provided with apertures (not shown) for the discharge of the drained sugar. The weight of the outer spindle with its loaded basket is thrown upon the inner spindle by means of the pin *h* passing through both the outer spindle and the bush *d*, which rests upon the anti-friction washers *e*. The washers are thoroughly lubricated by the space between the outer and inner spindles being kept full of oil from the cup *i* in the pulley *k*, and a well *j* is found below the end of the inner spindle as a settling place for the dirty oil, which can be drawn off by removing the small screw shown at the bottom of the well *j*. The combined pulley and brake *k* is fitted on the top of the outer spindle, and so placed and formed that the driving-belt and brake may neither induce nor be affected by the vibration of the spindle. The friction-brake *l*, lined with wood, is attached to the suspending-block *c* on the one side by the flexible steel strap *m*, and on the other by the bolt *n*. Upon this bolt the handle *o* turns, bringing the brake into contact with the pulley and stopping the machine. Thus, when the brake is applied, the whole weight of the outer spindle, with the basket and its load, is utilized to stop the



machine ; and whenever the machine is thus stopped the load is eased off the anti-friction washers, allowing the oil freer access between them. The manner in which the frame of the basket is stiffened, and its being made of mild steel of great tensile strength, diminish very much the risk of its bursting at high speed. The upper suspending-block may be hung from a box-beam between the pillars or walls of a sugar-house, or may be attached to an independent frame.

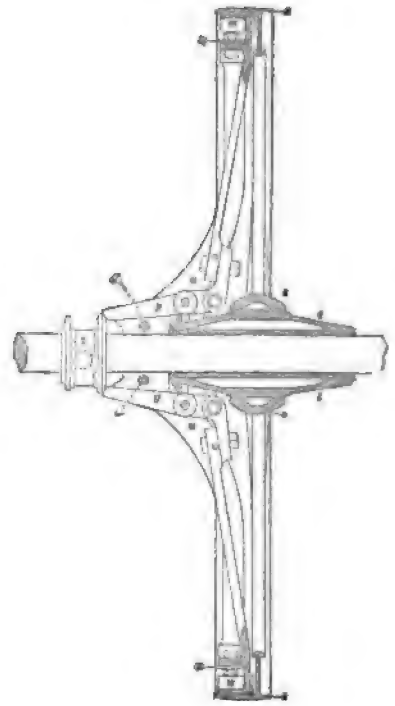
Fig. 16 explains the arrangement of the patent centrifugal driving-

FIG. 16, A.



ELEVATION.

FIG. 16, B.



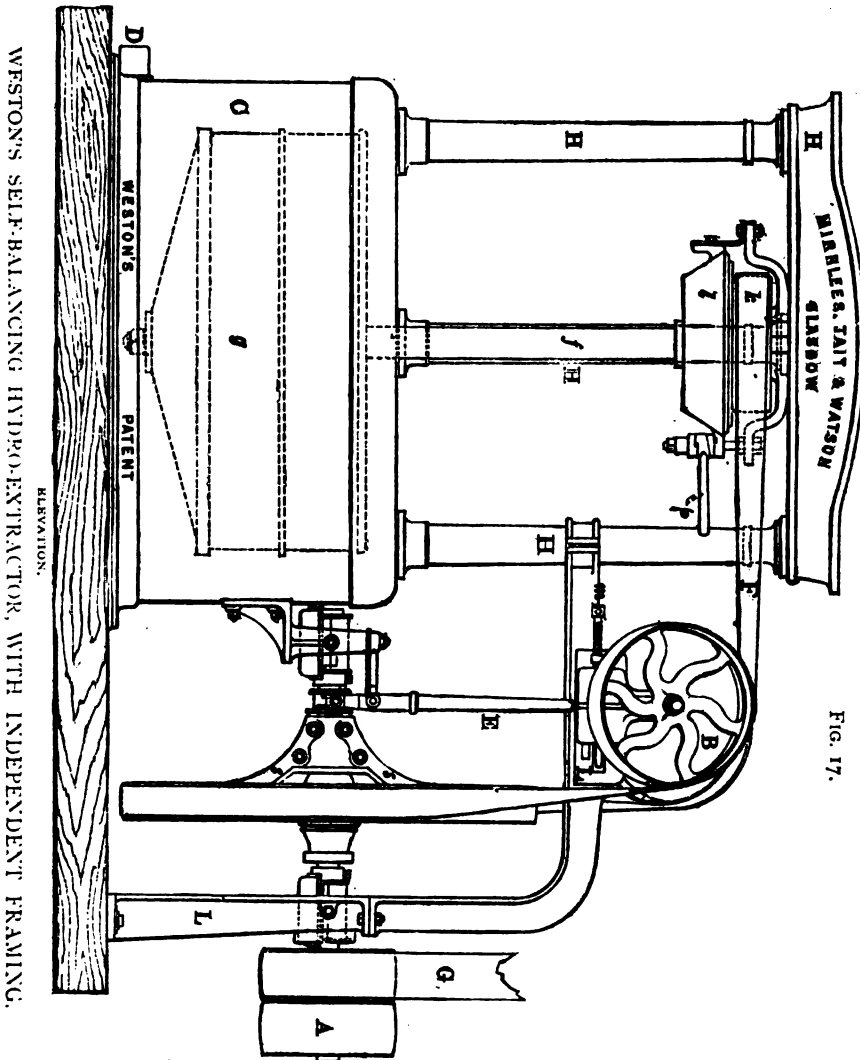
SECTION.

#### WESTON'S CENTRIFUGAL DRIVING-PULLEY.

pulley used in starting these machines. A is a side elevation, and B a section. The pulley *s* is fixed on the self-oiling bush *t*, in which the shaft revolves freely, and two driving-arms *u*, *u* are clamped firmly on the shaft by the bolts *v*, *v*. These fixed arms carry friction-pieces *w*, *w*, the weight of which is proportioned to the speed fixed for the shaft; at this speed their centrifugal action overcomes the restraining power of the steadying-springs *x*, and causes the friction-pieces to press against the inner surface of the pulley, the pressure being so adjusted that, although sufficient to drive the machine when

started, it is insufficient to overcome at once its inertia, and consequently slip takes place between the surfaces until the pulley attains the velocity of the driving-arms, thus gradually lifting the basket to its highest speed without bringing any undue strain on the driving-shaft, or causing the belt to slip and wear.

The friction-pieces  $w, w$  are attached to levers  $y, y$  between the



driving-arms, and by means of wedges on the sliding-collar  $z$  they are either left free to press against the rim of the pulley or are withdrawn from it, according as it is desired to start or stop the machine.

Fig. 17 (page 67) shows the mode of mounting one of these centrifugals in independent framing, with the position of driving-pulleys, belts, etc. *A*, fast-and-loose pulleys driven from prime-mover by belt *G*; *B*, idler-pulleys,—self-oiling; *C*, monitor, or safety outer case,—of wrought iron; *D*, outlet for liquid extracted,—the figure does not show the necessary height and the apertures required for removal of drained sugar; *E*, starting-handle; *F*, driving-belt; *f*, spindle; *g*, basket,—shown by dotted lines; *H*, framing for support of centrifugal machine; *k*, driven pulley on spindle; *L*, framing for driving-shaft; *l*, brake; *p*, handle of brake; *m*, screw for tightening belt; *s*, patent centrifugal driving-pulley.

The 18-inch machine was intended to run up to 1800 revolutions per minute, and the 30-inch up to 1500. Each machine of the latter size, it was stated, may be relied upon to drain four to five tons of sugar per day.

#### V. STATISTICS OF SUGAR PRODUCTION.

Among the replies to inquiries in reference to the production of sugar which General Francis A. Walker, Chief of the Bureau of Awards, was kind enough to officially address, at my request, to a number of the foreign Commissions, a valuable paper was received through Colonel Sir H. B. Sandford, British Commissioner, being a letter to Edwin J. Pearson, Esq., of the Statistical Department of the Board of Trade, London, from George Martineau, Esq., Secretary of the British Sugar-Refiners' Committee. This letter covers so well the ground I had proposed to examine, and comes from a source so well placed for obtaining information as to most of this ground, that it seems desirable to quote nearly the whole of it, placing any additional information side by side with Mr. Martineau's statements and remarks in connection with the several countries referred to.

In attempting to form an estimate of the aggregate production of sugar for the whole world one finds that direct returns are obtainable for some countries, but for others the quantities exported can alone be had, while in all such cases an additional amount—sometimes a very large amount—is undoubtedly produced and disposed of by domestic consumption, the real amount so consumed, however, and the total production, being both unknown quantities.

In regard to each country falling under this latter head I have endeavored to form an approximate estimate of domestic consumption by collection of such scattered facts as I could find throwing any light upon the matter, and by reference to authorities on the habits

as to food of the people in question;\* but, as the conclusions reached are necessarily of more or less doubtful character, and in some important cases little more than rough guesses, I propose to keep all such figures apart from those of more authentic value. It will be seen that there are very serious differences of opinion as to the production of some countries for which our information might be expected to be full and accurate. The variations as between successive crops, moreover, introduce another element of difficulty in establishing average figures.

LETTER OF MR. MARTINEAU.

"21 MINCING LANE,  
"9th October, 1876.

"EDWIN J. PEARSON, ESQ., *Statistical Department, Board of Trade* :

"SIR,—I have to acknowledge receipt of yours of 30th August, inclosing copy of the letter from the U. S. Centennial Commission to Colonel H. B. Sandford, British Commissioner at the Philadelphia Exhibition.

"In accordance with the request contained in the letter received from your Department on the 18th August, and with our conversation of the 29th of the same month, I now endeavor to give you what information I can in reply to the inquiries of the U. S. Commission; at the same time expressing my regret that considerable difficulty in obtaining some of the details on which the following figures are based, together with pressure of other engagements have so much delayed my reply.

"The Commissioners wish, as I understand, to obtain information on the following points :

"1st. Total sugar production of the world.

"2d. Countries whence raw sugar for refining is obtained, and quantities from each country.

"3d. Quantities from different sources of production,—cane, beet, etc.

"4th. Quantities of different kinds of manufacture.

"In reference to these inquiries I would first observe that in some producing countries there is no definite line of demarkation

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\* In forming these estimates some use has been made of a table, showing sugar consumption in various better-known countries, in the *Journal des Fabricants de Sucre* for 1875, quoted in v. Wagner's *Jahresbericht üb. d. Leist. d. chem. Technologie*, 1875, S. 780.

between raw sugar for refining and sugar fit for direct consumption. Though the total shipments from each country may be stated with tolerable accuracy, I cannot, therefore, say that my estimates of the quantities taken for refining are more than guesses.

"I.—A. CANE-SUGAR.

"Beginning with cane-sugar, and taking the producing countries in the order of their importance, the Spanish West Indian colonies come first.

"The average annual production of *Cuba* may be taken at 700,000 tons, of which the greater part goes for refining, except that which is shipped to Spain, which goes direct into consumption. I therefore estimate the quantity going for refining at 650,000 tons.

"The different kinds of manufacture in *Cuba* are, in their order of importance, centrifugal, muscovado, clayed, 2d products (called in *Cuba* molasses sugar and melado).

If this refers to exports, judging from the ratio borne by the Cuban export of sugar to the United States as compared with that to all other countries,\* and the average amount received in the United States, I am inclined to think the estimate too high,—a total export of 650,000 tons, of which 600,000 are for refining, would probably be nearer the truth. The civil war which has now lasted for many years has not, it is true, directly ravaged the best sugar-producing districts of the island, but its indirect influence has depressed all industry, and the tendency of productive capacity has been downwards. The *New York Shipping and Commercial List* of Autens & Bourne, 4 Cedar Street, New York (last issue for year ending December 31, 1876), from which much information as to the sugar trade of the United States has been derived, states the amount of sugar imported at New York from *Cuba*, in 1876, at 302,281 long tons (against 281,816 tons the previous year), and if to this be added the whole of the melado there imported (nearly all of which was doubtless from *Cuba*), viz., 16,164 tons (being a reduction of 40 per cent. from actual weight in order to place this on same footing as ordinary sugar), we have a total at this port of 318,445 tons. New York imports about three-fourths of all the foreign sugar received on the Atlantic side of the United States. The same paper states that the crop of 1875-76 showed a falling off of 140,000 tons from that of the previous year, but that the crop of 1876-77 will probably exhibit a partial recovery.

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\* *Quarterly Report of Chief of Bureau of Statistics for three months ending September 30, 1875.* Washington, 1875, pp. 143-147.

"The other Spanish island, *Porto Rico*, produces almost exclusively muscovado sugar, some of which, however, is of sufficiently high quality to pass direct into consumption. The proportion of such sugar is, however, rapidly diminishing. It may be said that the larger part of the crop now goes for refining. A small quantity of centrifugal sugar is made there. The average shipments from Porto Rico are 80,000 tons, of which perhaps 50,000 go for refining.

"The *British West Indian colonies*, with which may be included the *Dutch and Danish colonies* of *Surinam* and *St. Croix*, furnish annually about 250,000 tons, of which perhaps 150,000 tons are taken for refining.

"*British Guiana*, the most important of these colonies, contributes 75,000 tons, the greater part of which is now crystallized centrifugal sugar, going principally for direct consumption.

"*Trinidad* produces 50,000 tons, mostly muscovado sugar for refining; a small quantity of centrifugal sugar is now made there.

"*Barbadoes* produces 40,000 tons, nearly all muscovado sugar, but of superior quality, going to a large extent into direct consumption. A little centrifugal sugar is also made.

"*Jamaica* contributes 25,000 tons, principally muscovado sugar for refining. Here again there are one or two factories of centrifugal sugar.

15,000 tons a year would probably be a moderate estimate for the domestic consumption of the island.

New York imported from Porto Rico 9658 tons of sugar in 1876, against 12,717 tons in 1875.

Domestic consumption may perhaps be put at 5000 tons.

*San Domingo*, which in the last century furnished a very large part of the whole supply of cane-sugar to Europe, now exports none, but the sugar-cane is still cultivated to some extent, though its juice is for the most part converted into rum. It may be assumed that 300 tons of sugar are made.

Imported from Demerara, at New York, in 1876, 7806 tons; in 1875, 3255 tons.

Domestic consumption, say 1500 tons.

For imports at New York, see *Jamaica*; as also for consumption.

Imported at New York from Barbadoes in 1876, 3101 tons; in 1875, 4202 tons.

For consumption, see *Jamaica*.

Mr. Robert Thomson, who represented Jamaica at the Exhibition, estimated the product of the island at about 30,000 tons, beside £240,000 to £290,000 worth of rum.

Sugar imported at New York from Jamaica, Trinidad, and other British West Indies not separately specified was, in 1876, 3951 tons; in 1875, 3672 tons.

Domestic consumption for all the British West Indies may be taken at 10,000 tons.



"*Surinam* has an average production of 11,000 tons, consisting of muscovado for refining, with a little centrifugal.

Domestic consumption, say 500 tons.

French Guiana should probably be put down for a little sugar, but the amount must be small.

"*St. Vincent, St. Kitt's, and Antigua* each produce about 8000 tons of muscovado refining sugar.

"The other islands, with their production, are as follows:

<i>St. Lucia</i> . . .	6000 tons.
<i>Tobago</i> . . .	5000 "
<i>Grenada</i> . . .	5000 "
<i>St. Croix</i> . . .	5000 "
<i>Dominica</i> . . .	3500 "
<i>Nevis</i> . . .	2000 "
<i>Montserrat</i> . . .	1500 "

all, or nearly all, muscovado sugar fit only for refining, with the exception of *St. Croix*, which produces a superior quality of muscovado sugar.

"*Java* comes next in importance, with a production of 200,000 tons, mostly sugar of very fine quality, clayed and centrifugal. By far the larger portion, say 150,000 tons, goes, however, for refining.

See *Jamaica*, and also *Mexico*.

*St. Croix* is set down for 743 tons imported at New York in 1876, and 1756 tons in 1875.

*St. Thomas* is stated further on by Mr. Martineau to produce 800 tons of "concrete." Probably there should be an addition of 2000 tons made for this, Curaçoa, and other small islands not specified in his list.

Imported at New York in 1876, 2938 tons; in 1875, 13,473 tons.

San Francisco imported in 1876, from Batavia, 1248 tons.

Palm-sugar is made in the interior and in the eastern part of the island, and nearly all locally consumed.

Total domestic consumption may perhaps be put at 30,000 tons.

*Sumatra, Borneo*, and the remaining islands of the *Sunda and Molucca groups* also produce some sugar, although it does not enter into the general commerce of the world. A good deal of it is from palms, that of Borneo especially from the gomuti palm. 15,000 tons would probably not be too large an estimate for these islands.

"*Brazil* ships 170,000 tons, consisting principally of clayed and muscovado sugars, the greater part of which are brown sugars fit only for refining. The quantity which goes for refining might therefore be estimated at at least 120,000 tons.

The crop for 1876-77 is estimated at 180,000 tons.\* The average annual export of sugar from Brazil for the period from 1869 to 1874 is officially given as 153,285,533 kilos. = 150,863 tons. (*The Empire of Brazil at the Universal Exposition of 1876, in Philadelphia*,—published by the Brazilian Commission.)

At New York, in 1876, 17,172 tons were imported; and 19,708 tons in 1875.

Dr. N. J. Moreira, of the Brazilian Com-

mission, states the ratio between the amount of sugar exported from the province of Maranhao and that consumed at home in the same as 553 : 447. If we assume an average domestic consumption equal to but half the declared export, we shall have for the whole Empire under the former head, say 75,000 tons.

*Paraguay* produces some sugar for domestic consumption, say perhaps 5000 tons.

The *Argentine Republic* produces some sugar in its northern provinces, but I have no returns of the amount. Perhaps 1000 tons may be assumed, all of which is consumed in the country.

"*Manila* exports 130,000 tons, consisting mostly of brown clayed and unclayed in the proportion of 2 to 1. Of these shipments, 115,000 tons go to Europe and the United States, and are used entirely for refining, except the small portion which goes to breweries. 110,000 tons will therefore probably not be too large an estimate of the quantity taken for refining.

New York imported from the Philippines in 1876, 28,565 tons; and in 1875, 31,828 tons. San Francisco imported 13,283 tons in 1876.

Domestic consumption for these islands may perhaps be estimated at 27,000 tons.

"Exports from *China* now amount to 120,000 tons, but only a small portion has hitherto come to Europe or America. The quantity which goes for refining in these countries may perhaps be put at 10,000 tons. Whether the remainder is consumed direct, or goes through a process of refining, it is difficult to say. About 55,000 tons of the shipments are, according to the native official returns, white sugar and candy, and are probably consumed in that form. It is not known what proportion the shipments bear to the total production of China.

No sugar is specifically quoted as from China in the New York imports, but under the head of "other East Indies" (aside from Java and the Philippines), we find 254 tons in 1876, and 934 tons in 1875; most of this was probably Chinese.

San Francisco imported from China in 1876, 4077 tons. A good deal of sugar is doubtless carried in native junks coastwise, and to the great islands of the East, which escapes custom-house report.

It is extremely difficult to form even a guess at the domestic consumption, though it must doubtless represent in the aggregate a very large amount. Taking the supposed population of only the more southern provinces, the districts of sugar production and those readily accessible therefrom,\* a consumption of 300,000 tons would probably not be an excessive estimate.

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\* It is to be noticed that Chinese sugar finds its way as far north as Kiachta, at the fair of which place it is sold on a small scale.

*Japan* produces a little cane-sugar for domestic use, but the quantity seems to be quite small.

*Cochin China, Siam, and Burmah* are all producers of sugar to some extent for local use; the first upon a tolerably large scale, the last but scantily, and chiefly from palms. In 1865, Bangkok exported 81,966 piculs = 4867 long tons. (McCulloch's *Dictionary of Commerce*.)

Probably these countries may (if domestic consumption be included) be set down for 25,000 tons.

"*Mauritius* exports on the average 100,000 tons. The kinds are very various, ranging from white crystallized centrifugal to low brown after-products. About one-third of the shipments come to Europe. Part of these go direct to the consumer, but the larger portion is taken for refining. The remaining two-thirds go to Australia, New Zealand, the Cape, Bombay, etc., principally for direct consumption. The total quantity going for refining cannot therefore be put at a higher figure than 30,000 tons.

For domestic consumption, say 2000 tons. See *Réunion*.

"The French West Indian colonies of *Martinique* and *Guadeloupe* produce nearly 100,000 tons; the former island shipping 50,000, and the latter 48,000, tons in 1875. Of these quantities, 63,000 tons were white crystallized sugar, and the remainder brown sugars. A considerable portion of this white sugar is, however, used by refiners. It would probably be under-estimating the quantity going to refineries to put it at 50,000 tons of the total shipments.

Sugar imported at New York from *Martinique* and *Guadeloupe* in 1876, 13,006 tons; in 1875, 14,649 tons.

Domestic consumption probably 3000 tons.

"*Louisiana* now produces 75,000 tons. The kinds manufactured and the quantity going to refineries can, of course, be much more accurately ascertained in America than here. I believe and have assumed that practically none goes for refining.

The Louisiana crop of 1876-77, as given in detail for the different parishes by the New Orleans *Price Current* of Louis J. Bright & Co. (1877, p. 75), was 163,837 hogsheads, weighing 194,963,430 pounds, or 87,037 long tons, beside 264,695 barrels of molasses. Of this sugar, not more than about 15,000 tons represented refined and clarified, the remainder being open kettle, soft brown sugar (muscovado of Mr. Martineau), including 2d products. With these figures closely agree the returns of M. L.

Bouchereau. (*Statement of Sugar and Rice Crops of Louisiana for 1876-77.*)

Messrs. Autens & Bourne, of the New York *Shipping and Commercial List*, estimate (in a private letter) that 20 to 25 per cent. of the Louisiana product is taken for refining. There is also a little cane-sugar made in *Florida, Texas*, and the southern parts of *Alabama and Mississippi*. The estimate for the whole United States, including these, is 77,000 tons for 1875-76. Hence about 90,000 tons for 1876-77.

The Louisiana crops since the close of the civil war have been as follows:

1865-66 . . .	8,884 tons.
1866-67 . . .	19,152 "
1867-68 . . .	18,482 "
1868-69 . . .	42,455 "
1869-70 . . .	44,419 "
1870-71 . . .	75,402 "
1871-72 . . .	65,580 "
1872-73 . . .	55,938 "
1873-74 . . .	46,071 "
1874-75 . . .	60,044 "
1875-76 . . .	73,859 "
1876-77 . . .	87,037 "

"The shipments from *Peru* are rapidly increasing, and amount now to 50,000 or 60,000 tons per annum. It is probable that the production of *Peru* is not far short of 100,000 tons. The quantity going for refining ought, at the lowest computation, to be put at 40,000 tons. The kinds are crystallized centrifugal, 2d products, muscovado, and concrete.

The domestic consumption of home-made sugar may, perhaps, be put at 10,000 tons, and commerce with immediately neighboring states at as much more.

Eastern *Bolivia* and the lowlands of *Ecuador, New Granada, and Venezuela*, though exporting no sugar or insignificant quantities, all produce some for home consumption. The quantity used in *Venezuela* is said to be very large. The aggregate amount for all four may be estimated at something like 15,000 tons.

"*Egypt* produced in 1874 over 50,000 tons; but the crop cannot be put now at more than 40,000 tons, consisting of crystallized centrifugal and 2d products. At least half the crop may be estimated as going for refining.

We have here a great discrepancy with the statements prepared by the Egyptian Commission for the Vienna Exhibition. (Nothing was published at Philadelphia, and no new statistics on this head could be obtained.) In the *Catalogue raisonné de*

*l'Exposition Égyptienne*, pp. 23 and 117, it is stated that the magnificent plantations on the left bank of the Nile, between Beni-Souef and Rhodah, comprise in all about 200,000 feddans of land, of which 100,000 are annually in cane, and that each feddan yields on an average 2381 kilogrammes of sugar of all grades, besides molasses. This would give an annual production, from these plantations of the Khedive alone, of 234,000 tons. Such a quantity is so totally out of proportion with any probable domestic consumption, even though aided by Red Sea and caravan commerce, and though 50,000 tons were to be allowed for foreign shipments, that I cannot but believe the Vienna figures altogether erroneous.

Still, some allowance should probably be made over Mr. Martineau's statement to cover domestic consumption and Moham-medan commerce.

*Mexico and Central America*, though not mentioned at this point in Mr. Martineau's letter, are next set down in his general table for 40,000 tons, of which 30,000 are probably suited to refining. (See his remarks as to Central America, under *Natal*.) I presume that these figures are intended to refer to the entire crop, not to exports, most of the sugar made being consumed in the country. The Mexican Catalogue for the Philadelphia Exhibition states that some haciendas produce 1200 tons of sugar. In 1876, New York imported 3358 tons from "West Indies (not separately specified) and Mexico," and in 1875, 3894 tons. In 1876, San Francisco imported 163 tons from Mexico and 209 tons from Central America.

"*Réunion* produces 30,000 tons, the kinds being similar to those in Mauritius, except that a much larger proportion are suitable for refining, probably more than half.

Allow for domestic consumption, say 1200 tons. In the *New York Shipping and Commercial List* the combined crop of Mauritius and Réunion for the year ending August 1, 1876, is stated as 138,675 tons.

"*British India and Penang* export about 30,000 tons. With the exception of the centrifugal sugar now made in Penang, this may be described as mostly low brown, clayed, and muscovado. At least 20,000 tons must be taken as going for refining, some also going for brewing.

This is probably to be taken as including the sort of soft concrete known as "jaggery," or "goor," of which some supply reaches English refineries; also small quantities of sugar from the date-palm exported from Calcutta, and from the gomuti palm from Singapore.

San Francisco imported from Calcutta in 1876, 189 tons of sugar.

The domestic consumption is very large, representing far more than the exports. In Ure's *Dictionary of Arts and Manufactures* (1867) it is stated, as the result of returns, admittedly imperfect, made some years before to the Indian Government, that the local consumption of Bengal and the northwest provinces was estimated at 11,778,356 maunds, or 432,678 tons. Allowing for exaggeration in these figures, for internal commerce (transfer of sugar from southern to northern provinces), for importations, and for excess of moisture in crude "jaggery," the total domestic consumption of home-made sugar can hardly be put at less than 450,000 tons.

"The *Honolulu* exports now amount to over 10,000 tons, the greater part of which goes to the United States, whether for refining or not I do not know.

The Hawaiian Islands exported in 1874, 10,968 long tons, of which 8122 tons went to the United States and 2846 to Australia and New Zealand; beside 90,060 gallons of molasses. The New York *Shipping and Commercial List* states that San Francisco imported in 1876, 9191 tons. One-fifth of the product is estimated as consisting now of white (washed) and light yellow soft centrifugal sugar, for direct consumption, the remaining four-fifths for refiners' use.

350 tons of home-made sugar would probably be enough to allow for domestic consumption.

Some little allowance ought, no doubt, to be made for sugar produced in a rude way and used by the natives of the *Society Islands*, *Marquesas*, *Fijis*, etc., in the Pacific. 400 tons may perhaps be put down to their account.

"*Natal* exports 8000 tons, principally muscovado sugar, the greater part of which probably goes for refining. The same may be said of the 3000 to 4000 tons exported from Central America.

Domestic consumption, say 700 tons.

Allow for native production of sugar in *Madagascar*, *Mozambique*, and *Zanguebar*, say 3000 tons.

For *Angola* and the *West Coast of Africa* probably not less than 15,000 tons, to which may be added, as a possible esti-

mate for the little-known interior, 5000 tons more.

For *Algeria, Morocco*, and the rest of the *North Coast of Africa* very little, say 300 tons. For the *Cape Verde Islands*, possibly 50 tons.

There is still, I believe, a very little cane-sugar made on the southern side of *Sicily*, an island which in the twelfth and thirteenth centuries yielded most of the supply of Europe.

For *Spain* (the peninsula), say 500 tons.

The official publications of, and private information received from, the Commissioners of Queensland and New South Wales give as the total production by latest actual returns,—

Queensland, in 1873, 7987 tons (beside 442,253 gallons of molasses).

New South Wales, in 1874-75, 6855 tons (beside molasses).

Or, together, say 15,000 tons. The Australian production is rapidly increasing.

"*Australia* ships 5000 tons.

"The total shipments of cane-sugar from the various producing countries amount, therefore, to 2,100,000 tons, of which it may be estimated that about 1,250,000 to 1,500,000 tons go for refining.

[See Mr. Martineau's tabulated summary given at the end of this report.]

"B. BEET-ROOT SUGAR.

"Passing now to the European beet-root sugar crop, it will be found, as in the case of cane-sugar, that the larger part of it is afterwards re-manufactured into refined sugar, in spite of the improved system of purification applied to its production and the large quantity of refined sugar which is now made direct from the root.

"*France* produced in 1875, 450,000 tons. Of this quantity 2 per cent. was produced in the form of loaf-sugar; 39 per cent. as white crystallized sugar, the greater portion of which is, however, afterwards used in the manufacture of refined sugar; the remaining 59 per cent. going exclusively for refining.

In Dr. Scheibler's report on beet-sugar manufacture, forming a part of Hofmann's *Bericht üb. d. Entwickel. d. chem. Industrie, u.s.w.*, published in connection with the Vienna Exhibition, the production of France is put down (quoting from *Deutsche Industrie-Zeitung*) at 5,781,660 centner = 284,516 tons; but this refers to the disastrous war-year 1870-71, and is clearly unfair for

"The *German Empire* produced 345,000 tons, of which 23,000 tons were refined sugar, the remainder being afterwards re-manufactured.

"*Austria-Hungary* produced 155,000 tons, of which about 30,000 tons are produced directly in the form of refined sugar.

*"Russia and Poland produced 150,000 tons. [In a subsequent letter, dated 18th October, 1876, Mr. Martineau expresses a wish to correct this estimate, and proposes to place the Russian production at 250,000 tons.]*

purposes of comparison or average estimate. The exact yield for 1875-76 is given in the New York *Shipping and Commercial List* (probably on the authority of Mr. Martineau) as 462,259 tons,—this being the largest crop on record for Europe generally.

Scheibler gives for 1870-71, 5,259,734 centner = 258,832 tons.

V. Wagner's report (1876) gives the yield of 1875-76, 6,655,600 centner = 327,523 tons. The *New York Shipping and Commercial List*, as above, for 1875-76, 346,646 tons.

Scheibler gives for 1870-71, 3,645,600 centner = 179,406 tons. New York *Shipping and Commercial List*, as above, 153,922 tons.

There was a heavy falling off in the production of Austrian sugar in the years 1872-75. Thus, calculating from the quantity of beet-root returned, on the assumption of 1 ton of sugar for 12 of beet, the crop of the empire was:

In 1872-73	. 136,762 tons sugar.
" 1873-74	. 109,795 " "
" 1874-75	. 76,149 " "
" 1875-76	. 50,036 " "

(V. Wagner, *Jahresbericht*, 1874, S. 664, and 1875, S. 780.)

Scheibler gives the crop of 1870-71 as 2,700,000 centner = 132,867 tons. The New York *Shipping and Commercial List*, as above, gives that of 1875-76 as 245,000 tons.

Official returns, for which M. de Bielsky, Chief Russian Commissioner at Philadelphia, was so obliging as to write to St. Petersburg, and which, on December 3, 1876, he forwarded, give, on the authority of the Board of Trade and Manufactures, the following figures, with value in tons :

	In 1872-73.		In 1873-74.	
	Pud.	Tons.	Pud.	Tons.
Raw sugar produced in region of which Kief is the centre . . .	6,296,221	101,470	6,870,036	110,718
Raw sugar produced in region of which Warsaw is the centre . . .	7,454,657	120,139	7,834,339	126,259
Total . . .	13,750,878	221,609	14,704,375	236,977

The whole number of sugar-factories (given by Scheibler for 1870-71 as 481) is reported :

	In 1872-73.	In 1873-74.
In region of which Kief is centre .	284	291
" " " Warsaw is centre .	322	330
Total . . . . .	606	621





figures for Russia, see Mr. Martineau's tabulated summary at the end of this report.] This is the largest crop on record. The coming one is estimated at about 200,000 tons less. It is probable that at least 1,000,000 tons go for refining.

"C. DATE-, SORGHUM-, MAPLE-, ETC.,  
SUGAR.

"Information as to these kinds can be obtained more accurately in America.

M. Dureau (*État de l'Industrie du Sucre*, —Jury Report of Paris Exposition of 1867) estimated the annual production of palm- and date-sugar at 98,420 long tons, but upon what data I do not know. It has probably varied but little in the last ten years. In the above statements and estimates it has been counted in with cane-sugar.

The returns of the United States Census of 1870 give as the maple-sugar production of that year, 28,443,645 lbs., = 12,698 tons, beside 921,057 gallons maple-molasses. The *New York Shipping and Commercial List* takes 13,000 tons as the probable crop of 1875-76, estimates ranging from 12,000 to 15,000 tons. Nearly all of this is consumed on the farm, or forms the basis of petty local trade. Probably 10,000 tons would be quite a sufficient estimate for the production of Canada.

Scarcely any solid sugar is made in the United States from sorghum; nearly all assumes the form of syrup. The Census of 1870 gave 24 hogsheads, or say 12 tons of sugar, and 16,050,089 gallons of syrup, from this source.

Some sugar is also made from sorghum in Egypt, India, and China; but I know of no returns as to quantity distinguishing it from the product of the ordinary cane. One exhibitor from Italy, as has been noticed above, makes about 50 tons per annum.

"II.—DIFFERENT KINDS OF MANUFACTURE DIRECT FROM CANE AND BEET, *i.e.*, REFINED, CENTRIFUGAL, CLAYED AND UNCLAYED, MUSCOVADO, SECOND BOILINGS, ETC.

"a. Cane-sugar.

"I give this as a *rough guess*, after examining the modes of manufacture in each country as nearly as practicable:

Loaf . . .	None.
Centrifugal (1st products) . . .	600,000 tons.
Muscovado . . .	850,000 "
Clayed . . .	500,000 "

6

It is hardly correct to say that no loaf-sugar is made directly from cane-juice. Some of the choicer products of Cuba made with the aid of the vacuum-pan and animal charcoal, and thoroughly washed, although

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2d products (mostly centrifugal) . . .	125,000 tons.
Concrete . . .	25,000 "
	<hr/>
	2,100,000 "

the original cones have been broken up, are hardly distinguishable from refined loaf-sugar.

In this classification, moreover, a place should be made for the sugar-candy in large crystals of China.

" b. Beet-root sugar:	
Loaf, say . . .	60,000 tons.
White crystallized (centrifugal) . . .	210,000 "
1st products brown sugar (mostly centrifugal), say . . .	710,000 "
2d products (centrifugal), say . . .	330,000 "
	<hr/>
	1,310,000 "

[Correcting Mr. Martineau's figures for Russia as he desires.]

" At present the quantity of concrete produced may be stated as follows:

Peru . . .	10,000 tons.
Trinidad . . .	4,000 "
India and China . . .	4,000 "
Honduras . . .	2,000 "
Antigua . . .	1,500 "
Natal . . .	1,000 "
Guadeloupe and Martinique . . .	800 "
St. Thomas . . .	800 "
Central America . . .	400 "
Philippines . . .	400 "
Montserrat . . .	400 "
Dominica . . .	350 "
Brazil . . .	200 "
	<hr/>
	25,850 "

" The total quantity of sugar of one kind or another manufactured by the aid of the concretor (Fryer's), is estimated at 63,000 tons.

### " III.—REFINED MANUFACTURED FROM RAW SUGAR.

" Of the total quantity of sugar produced throughout the world from cane or beet, the following guess, necessarily a very rough one, has been made of the quantity which goes through the process of refining before being consumed:

Cane . . .	1,500,000 tons.
Beet . . .	1,000,000 "
	<hr/>
	2,500,000 "

"The principal countries in which sugar-refining is carried on on a large scale are Great Britain, the United States, France, Holland, Belgium, Germany, Austria, and Russia.

[I omit here a portion of Mr. Martineau's letter, in which he discusses the effects upon the sugar trade, and especially of refining, of the revenue bounties given in the form of export drawbacks by the Governments of France, Holland, the United States, Germany, and Austria.]

"The statement of sugar refined . . . . not including America, therefore stands thus:

	Tons of Raw Sugar refined.		
Great Britain	.	.	700,000
France .	.	.	530,000
Germany .	.	.	200,000
Austria .	.	.	100,000
Russia .	.	.	150,000
Holland .	.	.	120,000
Belgium .	.	.	30,000
Norway .	.	.	} 70,000
Sweden .	.	.	
Denmark .	.	.	
Finland .	.	.	
Italy .	.	.	
Spain .	.	.	} 1,900,000

"If to this be added 650,000 tons, as a possible figure for the refining power of the United States, we get nearly exactly the amount already stated as a probable estimate of the quantity of cane- and beet-root sugar taken for refining in Europe and the United States, viz., 2,550,000 tons.

The amount of raw beet-sugar refined in Russia ought, from data above given, to be now put at, say 200,000 tons, making the total below 1,950,000 tons.

This is undoubtedly an over-estimate for the United States. The Census returns for 1870 give as the materials used in that year in the 59 refineries of the United States, 804,408,427 pounds, = 359,111 tons of sugar, and 23,952,131 gallons of molasses, from which were made 754,010,951 pounds, = 336,612 tons, of refined sugar, the remaining products being refined syrup and molasses. The New York *Shipping and Commercial List*, whose figures are believed to be very trustworthy, gives the actual consumption of foreign raw sugar (brought in at all Atlantic ports) in 1876 as 581,369 tons, to which is to be added 26,497 tons for San Francisco (sugar brought from New York deducted), or in all, 607,866 tons. Messrs. Autens & Bourne (in a private letter) estimate that 85 to 90 per cent. of this is taken for refining; if we take the higher ratio, we have 547,079 tons. The same gentlemen estimate that 20 to 25 per cent. of the Louisiana, etc., product is

also so used; the higher of these numbers again gives on 77,000 tons—the total estimated crop of United States cane-sugar in 1875-76—19,250 tons. Hence we have as the highest probable total 566,329 tons taken for refining, or say 100,000 tons less than Mr. Martineau's estimate.

"If we examine the proportions of cane and beet actually used for refining in these various countries, we shall find them agree tolerably well with the previous estimates of the quantities of each kind taken for refining. The comparative quantities imported and home grown, and the quantity of refined exported, are also given in the following table:

	RAW SUGAR TAKEN FOR REFINING.				RE-FINED.
	CANE.	BET.	IM-PORTED.	HOME GRO'N.	EX-PORT.
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>
Great Britain...	590,000	110,000	700,000	.....	50,000 mostly yellow.
United States...	650,000	.....	650,000	.....	20,000
France.....	167,000	363,000	210,000	320,000	215,000
Germany.....	1,000	200,000	1,000	200,000	.....
Russia.....	.....	150,000	5,000	145,000	.....
Holland.....	100,000	20,000	100,000	20,000	80,000
Austria.....	.....	100,000	.....	100,000	40,000
Belgium.....	20,000	10,000	20,000	10,000	12,000
Other countries	70,000	.....	70,000	.....	.....
Total.....	1,598,000	953,000	1,756,000	795,000	417,000

The quantity assigned to Russia, ought, moreover, to be raised to, say 200,000 tons, as already noticed.

"I am, sir, yours faithfully,

"(Signed) GEORGE MARTINEAU,

"Sec'y British Sugar-Refiners' Committee."

I have been unable to find data for the general production of starch-sugar. For Germany, the following figures are quoted in V. Wagner's *Jahresbericht* (1875, S. 806) for the year 1874:

Starch-sugar in solid form	.	.	.	224,848 centner. = 11,065 tons.
" as syrup	.	.	.	296,660 " = 14,599 "
Beside caramel	.	.	.	26,120 " = 1,285 "

Two firms of the Netherlands, exhibiting at Philadelphia, together report an annual production of all kinds of starch-sugar of about 700 tons. The census of 1870 gives but one factory of this kind in the United States (another exhibited at Philadelphia), the value of whose

product is stated at \$115,100; this would probably represent about 700 or 800 tons.

I am equally without facts as to the aggregate production of milk-sugar, which is, however, small; and the product itself only on chemical, not on commercial, grounds to be counted with sugar in the ordinary sense.

Passing by these comparatively unimportant materials, I give first, as an attempt at an estimate of the quantity of sugar annually entering into the general commerce of the civilized world, the tabulated figures of Mr. Martineau's letter, as follows:

### "CANE-SUGAR.

	TOTAL ANNUAL AVERAGE, OR LATEST SHIPMENT.	PROBABLE QUANTITY TAKEN FOR REFINING IN EUROPE AND AMERICA (IN ROUND NUMBERS).
	Tons.	Tons.
Cuba.....	700,000	650,000
Porto Rico.....	80,000	50,000
British, Dutch, and Danish West Indies (See separate table.)	250,000	150,000
Java.....	200,000	160,000
Brazil.....	170,000	160,000
Manila.....	130,000	110,000
China.....	120,000	10,000
Mauritius.....	100,000	30,000
Martinique and Guadeloupe.....	100,000	80,000
Louisiana.....	75,000	?
Peru.....	50,000	40,000
Egypt.....	40,000	30,000
Mexico and Central America.....	40,000	30,000
Réunion.....	30,000	25,000
British India and Penang.....	30,000	20,000
Honolulu.....	10,000	?
Natal.....	10,000	5,000
Australia.....	5,000	.....
Total.....	2,140,000	1,550,000

BRITISH, DUTCH, AND DANISH WEST INDIES.	
	Tons.
British Guiana.....	75,000
Trinidad.....	50,000
Harbadoes.....	40,000
Jamaica.....	25,000
St. Vincent.....	8,000
St. Kitt's.....	8,000
Antigua.....	8,000
St. Lucia.....	6,000
Tobago.....	5,000
Grenada.....	5,000
Dominica.....	3,500
Nevis.....	2,000
Montserrat.....	1,500
Surinam.....	11,000
St. Croix.....	5,000
Total.....	252,000

### "BEET-SUGAR.

Production in 1875.  
Tons.

France . . . . .	450,000
German Empire . . . . .	345,000
Austria-Hungary . . . . .	155,000
Russia and Poland . . . . .	150,000 (250,000)
Belgium . . . . .	80,000
Holland . . . . .	30,000

Total . . . . . 1,210,000 (1,310,000)"

In conclusion, I offer the following general tables of my own compilation, in which the attempt is made to take into account all the known sources of cane-sugar (in the chemical sense—*i.e.*, sucrose), and the best estimates of present average annual production for the whole world, using all the data of the preceding pages, and stating in a separate column of Table A the supposed domestic consumption of sugar-producing countries. This consumption I have aimed to place at very moderate figures. The fourth column of the table is the result of the addition of the numbers in the second and third columns. For beet-sugar, I have made some deduction from the 1875 crop of France, Germany, and Austria, on the ground of its being exceptionally large. The estimates refer to sugar in the solid state only, as the data as to production and destination of molasses are far more imperfect; from the latter, however, it must be remembered, additional quantities of dry sugar are made in the refineries. The countries are taken in geographical order, not in order of sugar-producing capacity.

# A. CANE-SUGAR. (AND PALM-SUGAR.)

		PRESENT ANNUAL PRODUCTION.	PRESENT ANNUAL EXPORT.	ESTIMATED DOMESTIC CONSUMPTION.	ESTIMATED ANNUAL PRODUCTION.
		TONS OF 2240 POUNDS.	TONS OF 2240 POUNDS.	TONS OF 2240 POUNDS.	TONS OF 2240 POUNDS.
West Indies.	China.....		120,000	300,000	420,000
	Japan.....			500	500
	Philippine Islands.....		130,000	27,000	157,000
	Java.....		200,000	30,000	230,000
	Sumatra, Borneo, etc. (Sundas and Mo- luccas).....			15,000	15,000
	Cochin China, Siam, and Burmah.....			25,000	25,000
	British India and Penang.....		30,000	450,000	480,000
	Egypt.....	75,000			
	Zanguebar, Mozambique, and Madagascar			3,000	3,000
	Mauritius.....		105,000	2,000	107,000
	Réunion.....		30,000	1,200	31,200
	Natal.....		8,000	700	8,700
	Angola and West Coast of Africa.....			15,000	15,000
	Morocco, Algeria, and North Coast of Africa.....			300	300
	Sicily.....			50	50
	Spain.....			500	500
	Cape Verde Islands.....			50	50
	Louisiana (with Texas and Florida).....	90,000			
	Mexico and Central America.....	40,000			
	Spanish.				
	{ Cuba.....		650,000	15,000	665,000
	{ Porto Rico.....		80,000	5,000	85,000
	San Domingo.....			300	300
	English.				
	{ Jamaica.....		27,000		
	{ St. Christopher.....		8,000		
	{ Nevis.....		2,000		
	{ Antigua.....		8,000		
	{ Montserrat.....		1,500		
	{ Dominica.....		3,500		
	{ St. Lucia.....		6,000	10,000	174,000
	{ St. Vincent.....		8,000		
	{ Barbadoes.....		40,000		
	{ Grenada.....		5,000		
	{ Tobago.....		5,000		
	{ Trinidad.....		50,000		
	French.				
	{ Guadeloupe.....		48,000		
	{ Martinique.....		50,000	3,000	101,000
	Danish.				
	{ Santa Cruz.....		5,000	250	5,250
	St. Thomas, and other islands not specified.....	2,000			
	British Guiana.....		75,000	1,500	76,500
	Dutch Guiana, or Surinam.....		11,000	500	11,500
	French Guiana, or Cayenne.....	300			
	Brazil.....		175,000	75,000	250,000
	Paraguay.....			5,000	5,000
	Argentine Republic.....			1,000	1,000
	Peru.....		70,000	10,000	80,000
	Bolivia, Ecuador, New Granada, and Venezuela.....			15,000	15,000
	Hawaiian Islands.....		11,000	350	11,350
	Society Islands, and other islands of the Pacific.....			400	400
	Australia.....	15,000			
		222,300	1,962,000	1,012,600	2,974,600
					222,300
Total for civilized commerce.....			2,184,300		
Total for whole world.....					3,196,900



**B. BEET-SUGAR.**

										Present Annual Production. Tons of 2240 Pounds.
France	.	.	.	.	.	.	.	.	.	420,000
Italy	.	.	.	.	.	.	.	.	.	300?
Germany	.	.	.	.	.	.	.	.	.	320,000
Austria-Hungary	.	.	.	.	.	.	.	.	.	50,000
Russia	.	.	.	.	.	.	.	.	.	250,000
Sweden	.	.	.	.	.	.	.	.	.	2,600
Denmark	.	.	.	.	.	.	.	.	.	500?
Holland	.	.	.	.	.	.	.	.	.	30,000
Belgium	.	.	.	.	.	.	.	.	.	80,000
England	.	.	.	.	.	.	.	.	.	500
United States	.	.	.	.	.	.	.	.	.	300
Total										1,154,200

**C. PALM-SUGAR.**

		Present Annual Production.
		Tons of 2240 Pounds.
India, Burmah, etc.	}	. . . . . 100,000?
Java, Borneo, Sumatra, etc.		
Northern Africa, etc.		
		(To be deducted from total of A.)

**D. MAPLE-SUGAR.**

										Present Annual Production. Tons of 2240 Pounds.
United States	.	.	.	.	.	.	.	.	.	13,000
Canada	.	.	.	.	.	.	.	.	.	10,000
Total										23,000

**E. GENERAL SUMMARY.**

										Probable present annual production for whole world. Tons of 2240 Pounds.
Cane-sugar	.	.	.	.	.	.	.	.	.	3,196,900
Beet-sugar	.	.	.	.	.	.	.	.	.	1,154,200
Palm-sugar	.	.	.	.	.	.	.	.	.	100,000?
Maple-sugar	.	.	.	.	.	.	.	.	.	23,000
Sorghum-sugar	.	.	.	.	.	.	.	.	.	5,000?
Melon-sugar	.	.	.	.	.	.	.	.	.	100?
Total										4,479,200

## THE CHEMICAL ARTS.

## TRANSLATED EXTRACT FROM A REPORT ON THE INTERNATIONAL EXHIBITION.

BY F. KUHLMANN, *Fils.*

## CHEMICAL PRODUCTS.

**SULPHURIC ACID.**—The consumption of pyrites has become general in Europe, and it may almost be said that sulphur is now but exceptionally burned for the manufacture of sulphuric acid, the use of which is daily increasing.

The great deposits of cupreous pyrites in the province of Huelva, Spain, and the necessity for roasting this mineral in order to extract the copper which it contains, furnish sulphur for the manufacture of sulphuric acid at an exceedingly low price.

The process of combustion has been improved within the last twenty years. It is not my intention to give a history of pyrites furnaces, which have been fully described in the reports of former Exhibitions, but I may observe that the practice of using the pyrites in powder has increased, and by improvements in furnaces with successive beds, the burning of the pyrites in this form has been rendered as easy as that of pyrites in lumps.

The use of the "Gay Lussac" and "Glover" towers, first established at Freiberg, and afterwards in France and England, tends to become general, their great utility for the denitrification and concentration of sulphuric acid having been fully recognized. The first-named apparatus is too well known to require description. The "Glover" tower consists of a column of the same general construction as the "Gay Lussac" tower, and, like it, is filled with porous materials intended to multiply the surfaces of contact between the weak acid, which is made to flow from the higher part of the column, and the hot sulphurous gases escaping from the furnace. This simple apparatus, working with regularity, utilizes well the heat developed by the combustion of the pyrites, and causes a sensible economy in the cost of concentrating the acid essential in the working of the "Gay Lussac" tower.

In the acid-works furnished with the latest improvements, only very small quantities of nitrate of soda are used; the lead-chambers, which formerly required 5 parts of nitrate to 100 parts of the acid produced, consuming now only about 2 parts. The production of

sulphuric acid reaches at present in Europe about 1,000,000 of tons per annum; the improved process therefore reduces the consumption of nitrate of soda from 50,000 to 20,000 tons.

In order not to discourage the exporters of Chili and Peru, from which countries we obtain this product, it may be said that the employment of nitrates for agricultural purposes has greatly increased, and that the exports from the southern seas, amounting in 1870 to 2943 Spanish centavos, or 140,000 tons, reached in 1875 the enormous total of 7336 centavos, or 350,000 tons, showing an increase of 150 per cent. in five years.

The economical production of sulphuric acid in the United States is yet in its infancy; the mines of sulphur of Nevada are not yet explored upon a large scale, and the fact is most astonishing that pyrites, the supply of which is nevertheless considerable, have not yet been employed.

The sulphur of Sicily supplies most acid-works, and the expense of freight to Pennsylvania, the centre of this manufacture, is naturally considerable.

If the duty on copper were not so high, we believe that the manufacturers of the east coast of the United States might advantageously import Spanish pyrites, until they are in a position to develop their own mines.

It is the manufacture of alum, sulphate of quinine, and pharmaceutical products, and the refining of petroleum, which chiefly open a market in the United States for sulphuric acid. With a lower price for the latter, the manufacture of soda in this country is sure to develop itself.

With reference to the treatment of the residuum of pyrites in the wet way, the process which consists in roasting with common salt, and precipitating by the aid of iron the copper from the solution in which it is contained in the form of chloride, is now almost universally adopted.

MM. Faure & Kessler, of Clermont, exhibited a very ingenious apparatus for the concentration of sulphuric acid. It was a modification of the old platinum still, in which only half of the alembic consists of precious metal; the head was of lead, and was cooled by the weak acid resulting from the distillation. The price of this apparatus is not more than half that of the older one, and the inventors also claim a saving in fuel. Several works in France and England employ it successfully, and we believe that in this respect a step in advance has been made.

Refined sulphur, both in rolls and as "flowers," was well displayed

at the Exhibition by Messrs. Boude & Son, of Marseilles. The products of this house, which reach a total of ten millions of refined sulphur, were certainly very superior to similar products of other nations.

The quantity of muriatic acid of 22° necessary to attack sulphides and hypo-sulphites sufficient to yield 100 kilogrammes of precipitated sulphur, may be estimated at  $3\frac{1}{2}$  or 4 per cent.

At Fahlun, Sweden, sulphur is still prepared in small quantities by distilling pyrites in closed vessels. This industry, however, is not likely to assume any considerable proportions.

**FERTILIZERS.**—The employment of fertilizers in agriculture is growing daily. The increase of population in various quarters of the world makes a maximum production imperative, and in order to attain this end it is necessary to replace by artificial means the elements which have been drawn from the soil by cultivated plants; in fact, to restore what food for man and the lower animals has removed in the form of crops. England, France, Germany, and other European nations have comprehended the importance of chemistry in agriculture, and the manufacture of super-phosphates of lime, salts of ammonia, the use of nitrate of soda, and the preparation of compound manures have been greatly extended since 1867.

So far as Europe is concerned, no very novel methods in the manufacture of fertilizers were observed at the Exhibition.

Chili and Peru sent guano and nitrate of soda, and a North American company, the "Pacific Guano Company," deserves special mention. Their efforts to produce a varied and complete assortment of fertilizers seem to have been crowned with success.

The Pacific Guano Company has first of all employed the phosphates of lime on Howland Island, situated near the equator, in the Pacific Ocean. These deposits, which are like those of Peru, the result of long accumulations of the excrement of birds, contain no organic matter, which the heat seems to have eliminated, leaving only mineral matter.

For some years other deposits of phosphates on the Chincha, Lobos, and Swan Islands, the last named situated in the Gulf of Mexico, west of Jamaica, have been worked by this company. The greater part of these phosphates contain 60 to 66 per cent. of phosphate of lime, and are of a dark-brown color; a single variety nearly white being of exceptional richness, and containing nearly 80 per cent. of pure phosphate of lime.

The deposits on Chisolm Island are those which at present furnish the greater part of the raw material to the new establishment of the above-named company, situated at Charleston, South Carolina.

I may close this statement regarding the operations of the Pacific Guano Company with a few remarks on the menhaden fish, which is consumed in the manufacture of fertilizers by this company. After having been treated with sulphuric acid, it is mixed with the various phosphates in order to furnish the necessary nitrogen. This fish belongs to the family of herrings and sardines, and is found in immense quantities in the Atlantic Ocean, where 350 vessels are engaged in the fishery. The quantity of oil extracted from the previously-dried fish may be estimated at 100,000 hectolitres, and has alone a value of 8,000,000 francs, while the residuum, representing no less than 7500 tons of ammonia, treated with sulphuric acid and mixed with the natural phosphates, produces one of the richest and most complete of fertilizers, capable of restoring to most soils all the essential elements for their cultivation. Industry has thus succeeded in preparing artificially a product similar to that which nature has furnished in Peru.

The Southern Phosphate Company, of France, also displayed specimens at the Centennial Exhibition. The product furnished by the operations of this company is considerable, reaching the figure of 25,000 tons, one-quarter of which is exported. The minerals used are remarkable for their richness and the small proportion of iron and alumina present, a great advantage in the manufacture of superphosphates. The first quality contains an average of 71 per cent. of tribasic phosphate of lime, with only 5 to 6 per cent. of oxide of iron and alumina. These deposits of phosphates, situated in the Tarn and Garonne, which occur in France in the upper part of the eocene formation, covering a considerable area, appear to be the result—according to certain French geologists—of the disengagement of phosphoric acid, which, in passing through the strata of chalk, under the influence of volcanic action, has given rise to these masses of phosphate of lime. The variety of colors observed in the different veins, resulting perhaps from a carrying away of material, as well as the small quantity of fossils which are met with, seem to confirm this view. On the other hand, the well-known fixedness of phosphoric acid is a serious objection to this hypothesis. Other savants believe, and we are of the same opinion, that the formation of these phosphates is due either to marine deposits or to the evaporation of saline and phosphatic lakes.

**SULPHATE OF SODA.**—A new process in the industrial production of sulphate of soda had already been brought forward at the Vienna Exhibition; it is the process suggested by Mr. Hargreave. England displayed again at Philadelphia a very pure article prepared by that

system. The aim of the process of Hargreave is to obtain sulphate of soda, directly, without resort to sulphuric acid, by the action of sulphurous acid on rock-salt in the presence of vapor of water. The apparatus devised by Mr. Hargreave consists of a series of four cast-iron cylinders of large dimensions, the interior being lined with bricks, and having at the bottom an iron grating with movable bars. On this grating are built up blocks of agglomerated salt, obtained by working up a mixture of 3 parts of crushed rock-salt and 1 part of fine-grained boiled salt with a sufficient quantity of water to form a thick paste. These blocks are dried and broken into fragments of the size of the fist before they are put into the cylinders, which are heated by the flame of a furnace, circulating in flues suitably arranged. The temperature, a very important factor, upon which the success of the operation depends, should not exceed  $400^{\circ}$  Centigrade. The sulphurous acid is obtained by means of a series of pyrites furnaces, and is delivered with a certain quantity of air, and steam at a pressure of two atmospheres, under the grate of the first cylinder, and afterwards passes successively into the three other cylinders. If the operation has been well performed the whole mass is transformed into sulphate of soda, which may be easily extracted by removing the bars of the grating above mentioned. The vapors of hydrochloric acid resulting from the operation are condensed in a series of chambers, or towers, the arrangement of which may be varied, and through which a current of cold water passes.

Without discussing the economy of the process, it may be said to be a very interesting one, and likely to render good service under certain circumstances.

**SODA.**—The manufacture of soda was chiefly represented at the Exhibition by English products, which are imported to a considerable extent by the United States. A great deal of the soda manufactured in England, especially in Lancashire, in the shape of caustic soda, carbonate of soda, and soda crystals, is shipped to America, where the manufacture is as yet very little developed.

The want of rock-salt rendering the United States dependent upon Canada, and the high price of sulphur, due to the supplies of pyrites and the sulphur of Nevada not being worked, have up to this time retarded the development of the manufacture of soda, an indispensable material for a large number of industries.

There is, however, one soda-factory of considerable importance in Pennsylvania using the cryolite of Greenland; but the mining of this material, containing about 90 per cent. of fluoride of sodium and aluminium, can only be carried on during four months in the year,

owing to the ice and snow. Even the vessels employed in transporting it to Philadelphia must be specially constructed with a view to resist the icebergs, which almost always impede navigation in this region. Judging from the documents which have been placed at my disposal, I do not think that the Greenland workings will ever result in any great development, or that the fluoride of sodium can be furnished in sufficient quantity to supply the demand of chemical industry from this source. The pure cryolite is, in fact, a fluoride of aluminium and sodium, being composed as follows :



and contains :

54.1 parts of fluorine,  
32.8 parts of sodium,  
13.1 parts of aluminium ;

but the best quality of the mineral as imported contains only 88 to 90 per cent. of pure cryolite, in combination with a little carbonate of lime, sulphide of iron, and silica.

The treatment of cryolite for the production of soda is very simple, and may be seen in perfect operation in the works of the Pennsylvania Salt Manufacturing Company, at Natrona, near Pittsburgh, Pennsylvania. This company obtains the crude cryolite at a cost of 80 francs per ton in Greenland, which brings its price up to 130 francs at Philadelphia, and 150 francs at Natrona; the annual consumption amounts to 6000 tons. Having visited the works at Natrona, I will say a few words about this manufacture.

The cryolite is mixed with lime and carbonate of lime in the following proportions :

50 parts of cryolite, containing about 88 per cent. of fluoride of sodium and aluminium ;

43 parts of lime ;

21 parts of carbonate of lime.

The thoroughly pulverized and sifted mass is fritted for an hour in a reverberatory furnace in charges of 500 kilogrammes, at a low red heat, and afterwards submitted to a systematic leaching. The alumina, combined with the soda, runs off in the solution formed, and the lime combining with the fluorine constitutes a residuum, not as yet utilized, containing 62 per cent. of fluoride of calcium, 12 per cent. of carbonate of lime, iron, and magnesia, silica, lime, and a little carbonate of soda with a trace of potash.

The precipitation of alumina from the solution of aluminate of soda at 28° Beaumé, resulting from the leaching, is caused by a violent cur-

rent of carbonic acid gas in immense reservoirs in the shape of generators. The remaining solution containing the carbonate of soda is evaporated, and the soda produced is of great purity, containing neither sulphide of sodium nor iron; the hydrate of alumina is used at other works in Philadelphia in the preparation of sulphate of alumina, and potash and ammonia alums.

Referring to the composition of the cryolite, which I have mentioned above, and to the technical data furnished me by the managers of the works, who kindly placed their services at my disposal, affording me every desirable information, and who accompanied me on my visits to the works, it appears that there are obtained from the cryolite of 90 per cent., 20 per cent. of alumina and 65 per cent. of pure carbonate of soda; instead of 21.52 per cent. of alumina and 75.53 of carbonate of soda, which theory would give from pure cryolite, without loss during the manufacture. A large part of the soda manufactured in this way is utilized in the manufacture of crystallized carbonate of soda, which ultimately is used in the preparation of bicarbonate of soda, the consumption of which is so great in America for the production of soda-water, artificial mineral waters, etc.

In reference to the manufacture of crystals of soda, the temperature in this country is so high during three months of the year that it is impossible to obtain crystallization; large reservoirs of twelve to fifteen thousand cubic metres serve to keep the solution during the summer, and in winter only does crystallization take place to a great degree. The reservoirs are emptied in the spring, and furnish from four to five million kilogrammes of crystals of soda.

We observed in the English section the exhibits of two factories which produce salt of soda by the action of ammonia and carbonic acid on *sal gemmæ*, or on brine directly obtained from salt mines. Messrs. Richards, Kearne, & Gasquoine, and Messrs. Brunner, Mond, & Co., of Cheshire, exhibited products of fine quality, which show the improvement made in the process of Solvay. This consists in purifying the waters of *sal gemmæ* mines (raw brine) by the action of an alkali, or of an alkali and lime; the quantities used varying according to the purity of the brine.

In the French section, Messrs. Solvay & Co., of Varangeville, also exhibited remarkable products manufactured by the process of which Mr. Solvay is the inventor; the works established at Varangeville produce salts of soda with the aid of brine from *sal gemmæ* mines. Messrs. Solvay & Co. also displayed in the Belgian section salts produced by the same process, but with *sal gemmæ* dissolved. There, as well as in England, these gentlemen met with great difficulties,



which, however, according to their statement, they have perfectly overcome. It is difficult to establish a comparison as to the economy between the old process of Leblanc and that with ammonia, because the saving is liable to vary, and depends on circumstances,—country, price of crude material, particularly of ammonia, and the selling prices of the secondary products, such as muriatic acid and chloride of lime; but we commend with pleasure the efforts which have been directed towards the improvement of the soda-industry in the method of Leblanc as well as in the ammonia process.

**POTASH.**—A very considerable development which has taken place within a few years in the manufacture of carbonate of potash by the process of Leblanc deserves mention. It is chiefly in France and Germany where this branch of manufacture has gained importance. The chlorides of potassium used are found either in the mines at Stassfurt, or are obtained by purifying salts of beet-root molasses, or by treating incinerated sea-weed. The potash thus obtained is very pure, and generally contains 90 per cent. of carbonate of potash. It competes strongly with the potash of Russia and America, and has not only excluded the latter from the French and English markets, but is shipped across the ocean, and is sold in considerable quantities in the United States, particularly for the manufacture of pharmaceutical products.

**PRUSSIAN AND CHLORATE OF POTASH.**—With reference to the other salts of potash of importance, as the prussiate, the chlorate, and oxalate of potash, no new process seems to have been put in practice. In Germany, the manufacture of the oxalate by means of saw-dust and caustic soda is very extensive, while in North America the manufacture of yellow and red prussiates has assumed large proportions.

**HYPOCHLORITE OF LIME.**—The greater part of the hypochlorites of lime were exhibited by England, and nearly all the products were manufactured by the process of Weldon. This process, which originated several years ago in England, is now almost universally employed in extensive chemical works. The numerous attempts which have been made to regenerate the manganese contained in the residuum in the manufacture of chlorine have only effected a very little saving, although the rich manganese ores daily become more scarce, and the prices higher. The recent application of manganese in the manufacture of ferro-manganese, which introduces this compound into the manufacture of steel, must still further increase the value of these ores. The introduction of the process of Weldon, with the different improvements which have been made within a number of years, is liable to reduce by nine-tenths the quantity of

manganese necessary for the manufacture of chloride of lime. It is well known that this process consists in first neutralizing the free acid contained in the chloride of manganese which has served in the manufacture of chlorine, by allowing a violent current of air at a temperature of about  $60^{\circ}$  to act on the chloride of manganese mixed with lime. The combination which is then produced is rather hard to define, and seems to be a compound of bimanganite of lime, of protoxide of manganese, and of manganite of lime. It would be hard to state how this combination is brought about; Weldon believes that the protoxide of manganese,  $MnO$ , is oxidized first, and then transformed into  $Mn_2O_3$ , or rather into  $MnO$  and  $MnO_2$ , the latter giving the manganite and bimanganite of lime, which have been already alluded to. So far as the protoxide of manganese itself is concerned, it is oxidized anew, and a similar recombination commences. In reference to this nothing definite can be said. The adding of lime at certain stages of the operation seems to contradict the theory of Weldon. We must also take into consideration the fact that the quantity of lime used in this process, varying according to its quality, is of great importance in obtaining perfect oxidization, and in allowing of a quiet sediment. This sediment, from which the chloride of calcium has been separated by decantation, is received in large stills of stone, where it is treated with chlorohydric acid under the influence of steam, evolving the necessary chlorine for the preparation of hypochlorite of lime. The fresh manganese, which it is necessary to use in the proportion of 5 to 10 per cent., serves simply to restore the losses sustained during the operation.

The attempt has been made to produce chlorine by the action of chlorohydric acid on oxide of copper (the process of Gaskill and Deacon), but from an economical point of view it is not likely that the method will ever be put into practice, however interesting it may be.

**BORAX.**—The manufacture of borax in America has assumed vast proportions within the last few years, and threatens to rival European production. In 1867, England nearly possessed the monopoly of this manufacture, obtaining the boracic acid from Tuscany. France, however, of late, not willing to remain dependent upon her neighbors for this product, has manufactured borax from borate of lime procured from Asia Minor. A sensible fall in the price of this article was a natural consequence. America, however, seems to be desirous of reducing the cost still further. Indeed, after having manufactured borax for some years from borate of lime imported from Bolivia and Peru, she now explores the repositories of borate

of soda, or borate of soda and lime, situated in California, along the Pacific coast.

The principal firm exhibiting products, the purity of which we have been able to ascertain, is that of Messrs. Baker & Co. of New York.

The borate of soda is purified by means of several successive evaporations and crystallizations. The deposits of borate of soda appear to be abundant, and a single source recently explored will yield sufficient material for the manufacture of 40,000 tons of refined borax. In consequence of these new sources of supply the price of borax will probably be very much reduced, and this article will be more frequently applied in the various industries, as in faïences, painting, soldering, dressing of fabrics, etc.

ALUM.—The manufacture of alum, alum of potash, and alum of ammonia, is of great importance in the United States, and particularly in Philadelphia. We saw magnificent crystallized blocks at the Exhibition, some of which looked like real alum chambers or caves, which must have required crystallizing pans of vast dimensions, and were remarkable for their great purity. It may be stated, however, that no new process seems to have been employed in the manufacture of this article.

## FINER CHEMICALS, INCLUDING COAL-TAR COLORS.

BY J. W. MALLET.

Most of the matters to which these notes refer were originally assigned to other hands in the partition of work among the Judges of Group III. Having, therefore, had but imperfect opportunity for minute study of the Exhibition in these directions, especially as regards personal conversation with exhibitors or their representatives, I feel scarcely prepared to write a formal report; but at the request of the Chairman of the group, and of the Chief of the Bureau of Awards, I make a brief statement of the principal points which seemed worthy of attention, particularly noting progress since 1873, the date of the Vienna Exhibition. As no discovery of first-rate consequence in this field has been made since then, and as this department of the Exhibition, although highly interesting, was far from a complete representation of the chemical industry of the world, the absence of a more elaborate report is the less important.

A rough classification is adopted, throwing together substances of generally analogous character and use.

## A.—INORGANIC CHEMICALS.

1. BROMINE.—This, which but a few years ago ranked decidedly among the rarer substances, has become the subject of manufacture upon so large a scale that it may seem rather entitled to be classed among "heavy chemicals." As, however, its chief uses are still found in connection with photography and medicine,—the attempt to substitute it for iodine in the manufacture of coal-tar dyes having met but limited success,—it may receive mention here; and as the bromine-industry of Germany (Stassfurt), it is admitted, has fallen off from the pressure of American competition, it seemed well to collect some information as to the manufacture of the substance in this country.

Bromine was exhibited from Pomeroy, Ohio, by Mr. John J. Juhler, of the Pomeroy Bromine Works, and from Mason City, West Virginia, in the collective exhibit of West Virginia, these representing now the two principal centres of production. It was originally made—from 1846 to 1856—at Freeport, Pennsylvania, and afterwards—from 1866 to 1873—at Tarentum, Natrona, and other points in Western Pennsylvania; and within the last two years a small quantity has been made in Tuscarawas County, Ohio. The material used is the "bittern" left after crystallizing out the common salt of brine from the brine-wells of the region in question. This bittern varies in density from about  $38^{\circ}$  to  $45^{\circ}$  B. at  $60^{\circ}$  F. At  $45^{\circ}$  B. it yields, at Pomeroy, from 0.5 to 0.6 per cent. of bromine. It is said that the proportion of bromine increases in going northwards, becoming 0.65 per cent. in the neighborhood of Athens, Ohio, more than 0.7 near McConnellsville, 0.8 per cent. on the Muskingum River, and 0.9 per cent. in Tuscarawas County, Ohio. The doubtful—but, if true, very important—statement has lately been made\* that in all these localities in West Virginia and Ohio the bromine is accompanied by about one-third of its weight of iodine.†

The following is the method of manufacture, copied obviously, in its main features, from that in use in Germany. The bittern is distilled with sulphuric acid and black oxide of manganese, potassium chlorate being sometimes, though rarely, substituted for the latter. The still is made of sandstone, sometimes hewn out of a single block, cubical or cylindrical in shape, and covered by a top-plate or

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\* *Oil, Paint, and Drug Reporter*, of New York, Feb. 14, 1877, p. 10.

† A sample of bittern from the kettles of the Kanawha Salt Company (West Virginia) now in my hands, gives, indeed, the qualitative reactions of iodine quite readily, but no such quantity of the element as that above stated is present.

lid; sometimes, in order to increase the size of the vessel, in two pieces, fitting the one upon the other, with the seams grooved and cemented with sodium silicate, sand, and crude calcium chloride from the exhausted bittern; sometimes flat slabs are fitted to each other, cemented, and held together by bolts. The lid is held down by its own weight, and luted with stiff clay, kept moist by "bitter-water"—spent bittern, rich in calcium chloride. The lid is fitted with a funnel and pipes for charging the still and for the escape of the bromine vapor, and at the bottom of the still is a plugged hole for running off the residue. The stills hold from 100 to 500 gallons. Heat is generally applied by a jet of steam carried directly into the contents of the still, causing agitation and thorough mixture of the materials. In some of the older retorts an iron flue covered with sheet-lead was carried through the sides, coming from a portable coke-furnace. The cooling-pipe is of lead,  $\frac{3}{4}$  inch or 1 inch in diameter and about 10 feet long, coiled spirally into a common worm, and placed in a barrel, through which cold water is run as usual. At some of the works the practice is to introduce into the still the bittern, boiling hot from the evaporating-kettles, then to add about 1.25 per cent. of sulphuric acid (previously diluted with twice its bulk of water), turn on the steam, and finally add oxide of manganese, to the extent of about half the weight of the sulphuric acid, in fine powder, and stirred up with bittern, the manganese being introduced in small portions as the bromine distills over. The receiver is a glass bottle with a wide mouth, whence the uncondensed vapor is carried off by a lead pipe, to be condensed in a solution of caustic soda. Sometimes a coke-tower, with bittern flowing down over the coke, is used for this condensation; but a vessel with caustic soda solution seems to be preferred, the bubbling through serving as an indication of the way in which the still is working. The bromine is washed with water, and put up for market in glass bottles with ground stoppers, those used at Pomeroy usually holding  $6\frac{1}{2}$  pounds. Sometimes what are called 1-pound ammonia-bottles are used, holding about 2 kilogrammes of bromine. The spent liquor from the stills is neutralized with lime, precipitating iron derived from the manganese, and then evaporated to such a density that it will solidify on cooling. While hot and liquid it is poured into barrels, and is afterwards sold as crude chloride of calcium, used principally for drying the air in fruit-houses—drying of apples, peaches, etc.—and to make the saline baths in which the tin cans of fruit, fish, oysters, etc., to be preserved by hermetically sealing, are heated. This material is also available for making artificial stone under Ransome's patent. In distilling the

bromine no special arrangement is in use for the protection of the workmen's health, except that the still-house is so built as to allow free passage of air through it, and the position of the stills is such that the men can have the benefit of the usual direction of the wind.

Mr. Juhler, to whom I am indebted for several private communications on this subject, estimates the total American production of bromine for several years past as follows :

In 1867 .	10,000 to	15,000 lbs.	In 1871 .	125,000 to	130,000 lbs.
" 1868 .	35,000 "	40,000 "	" 1872 .	160,000 "	165,000 "
" 1869 .	65,000 "	70,000 "	" 1873 .	170,000 "	175,000 "
" 1870 .	100,000 "	110,000 "			

with no material increase since 1873. He states, however, the actual production of his own Ohio works as 100,000 pounds per annum in 1875 and 1876, while Mr. M. F. Maury, Commissioner for West Virginia, gives me the present annual production of that State as 120,000 to 130,000 pounds. The whole amount produced in Tuscarawas County, Ohio, is put at not over 140 pounds per day, corresponding, probably, to 20,000 or 25,000 pounds a year. So that the total production of the United States is probably not short of 250,000 pounds per annum.

The average price during 1876 was about 35 cents per pound, while in 1875 sales were made as low as 30 cents, the cost of production at some works being over 28 cents. Up to 1870, the whole of the bromine made was consumed in the United States. In that year the first shipment was made to Germany, and since then more or less finds its way every year to the European market.

A direction in which, it seems to me, profitable use might, perhaps, be found for bromine at its present low price, is the working for gold of the poor "beach-sands" of Oregon, and, very likely, of "tailings" from many of the Californian quartz-mills. Laboratory experience shows the great readiness with which gold is dissolved by bromine-water, and there are probably many localities in the Far West where this solvent might be used at which chlorine, as originally suggested by Plattner, would not be available.

2. SALTS OF THE LESS COMMON METALS, INDUSTRIALLY APPLIED.—Silver nitrate, in large quantity and in crystals of unusual size, was shown by several exhibitors. One Canadian firm had a jar containing 50 pounds of this salt, for which photography has so greatly increased the demand; and in the sample shown by Messrs. Powers & Weightman, of Philadelphia, were some tabular crystals measuring 8 inches by 4 inches.

In the American section, the double salts of nickel and cobalt with ammonium deserved attention, not only on account of their fine condition, but as representing the material for an important and comparatively new branch of electro-metallurgy first made practically successful in the United States.

The most interesting novelty of the last year or two was not directly exhibited, namely, salts of vanadium produced upon a manufacturing scale, and at a comparatively very moderate price, to be used by calico-printers in the development of aniline black. These compounds—the discovery of an available source of which we owe to Prof. Roscoe, of Manchester, as well as important additions to our knowledge of the metal and its compounds—are produced by the Magnesium Metal Company, of Patricroft, near Manchester, England, and sold at 22s. 6d. per ounce for the oxide.

The quantity required to aid in transferring oxygen from potassium chlorate to the aniline salt is so excessively minute as to readily admit of the rare metal being so used at this price. An application in a small way of this mode of producing aniline black on the fibre of cloth was exhibited by John Blackwood & Co., of London, in the shape of a new marking ink for clothing, to which they have given the name "Jetoline."

3. INORGANIC PIGMENTS.—Among the most noticeable of these was ultramarine, exhibited, as was natural, on the largest scale by Germany, but also sent by French and Belgian makers. The various grades of the well-known blue color, some greens of brighter tint than usual, and the newer and very attractive *violet* ultramarine, said to contain calcium in considerable quantity, were sent by the Nürnberg Ultramarine Works, an establishment turning out from 1,000,000 to 1,250,000 kilogrammes per annum. As a curiosity, though of no commercial value, the specimens of ultramarine having the constituent sulphur replaced by selenium and tellurium, sent by M. Guimet, of Lyons, were deserving of notice.

From Austria there came a fair but not brilliant display of uranium compounds and colors prepared therefrom for porcelain painting, as also of vermilion; the former from Joachimsthal, in Bohemia, the latter from Idria, in Carniola.

In the Chinese department there was a little fine vermilion, such as has long had a reputation which is for the genuine product of Chinese industry well deserved.

4. RARE INORGANIC SUBSTANCES AS SPECIMENS AND MATERIALS FOR CHEMICAL RESEARCH.—Of these, two or three of the German cases presented the most interesting examples. The well-known house of

Trommsdorff, of Erfurt, had salts of lithium, cæsium, rubidium, glucinum, cerium, lanthanum, didymium, erbium, zirconium, titanium, and vanadium, in many instances of great beauty, with several of the rarer metals. Dr. Marquart, of Bonn, presented some excellent materials for analytical use. Dr. Schuchardt, of Görlitz, exhibited metallic lithium in large globules as well as in wire, metallic rubidium, thallium, indium, and tellurium, sublimed selenious oxide, sulphates of rubidium, yttrium and thorium, erbium nitrate, and sodium bivanadate in great red crystals, which most chemists would be likely to pass by as common potassium bichromate. No specimen was to be seen of the last discovered metal, gallium, or any of its compounds.

#### B.—ORGANIC CHEMICALS.

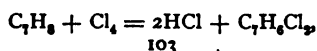
I. ALCOHOLS AND THEIR DERIVATIVES.—The most remarkable collection of these compounds was exhibited by the house of Kahlbaum, of Berlin, which since 1872 has devoted itself specially to this line of work. The iso-propyl, iso-butyl, and iso-amyl series were admirably illustrated by numerous specimens whose purity was vouched for.

The Joint-Stock Chemical-Factory, formerly the house of E. Schering, of Berlin, exhibited remarkably fine chloral hydrate, both in cakes and in the form, much less known in America, of distinct crystals. The firm of Saame & Co., of Ludwigshafen, had also both forms of this substance, and in addition, chloroform made on the large scale from chloral hydrate and guaranteed free from all foreign chlorine compounds. The extending use of chloral hydrate as a preservative agent in connection with various kinds of organic matter deserves notice as an addition to its value in medicine as a sedative and hypnotic.

Iodoform, finely crystallized, was exhibited by several houses, both German and American.

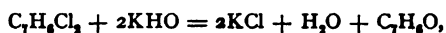
Mono-brom-camphor, of which no small use is made in medicine, especially in the United States, was shown in large cakes and beautiful condition by the houses of Schering, Powers & Weightman, and others.

2. ARTIFICIAL ESSENTIAL OILS.—Several of these interesting, though comparatively simple, results of modern synthetic chemistry were to be found in the German section. Thus, Dr. F. Wilhelmi, of Reudnitz-Leipzig, had a large sample of artificial bitter-almond oil, made, I believe, by the continued action of chlorine upon toluole from coal-tar, giving a di-chlor-toluole (benzylene chloride),





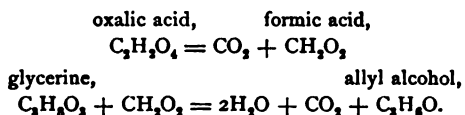
and the distillation of this with an alkaline hydrate in alcohol, yielding benzoic aldehyde (bitter-almond oil),



the product so obtained being of course free from the hydrocyanic acid which occurs in the crude oil of the bitter almond itself. The exhibitor is the only manufacturer of this material for perfumers' and liqueur-makers' use.

Dr. F. v. Heyden, of Dresden, along with his exhibit of synthetically-prepared salicylic acid, had a bottle of artificial winter-green oil (methyl salicylate) made with such acid. Its odor was not altogether satisfactory, doubtless owing to traces of impurity, since the bulk of the material was of course identical with the natural oil.\*

The house of Kahlbaum, among the fine alcoholic preparations, had several litres of artificial black-mustard oil (amyl iso-sulphocyanate) from allyl alcohol, the latter itself obtained from glycerine by distillation with crystallized oxalic acid,—



This is now regularly manufactured in considerable quantity. Our knowledge of a number of these sulphur oils has been increased of late by the labors of Hofmann's laboratory.

3. GLYCERINE.—The best display of this now important substance came from American, English, and Austrian factories.

The samples sent by Hartmann, Laist, & Co., of Cincinnati, Price's Patent Candle Company, of London, and F. A. Sarg, Son, & Co., of Liesing, near Vienna, were remarkably thick, clear, and brilliant. The very general preference shown a few years ago in the United States for Price's glycerine, as the standard of purity, has given place to a recognition of the fact that American manufacturers now turn out a product which is equally good. There was a little refined glycerine from the house of Schering, of Berlin; but Germany and France were not well represented in this direction.

4. PHENOLS.—Ordinary phenol, or carbolic acid, was most conspicuous in the exhibits of F. C. Calvert & Co., of Bradford, near Manchester, England, and the Joint-Stock Chemical-Factory (E. Schering), of Berlin. The former house, the death of whose founder recently has been a heavy loss to the interests of industrial chemistry, had a

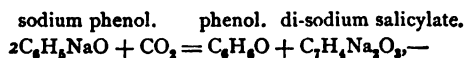
\* It has been stated (*American Chemist*, Dec. 1876, p. 218) that ethyl salicylate was here substituted for the methyl compound.

large slab of beautifully crystalline phenol, manufactured upon a very large scale, which retained its condition remarkably well through the unusually hot summer. With it were shown also the sulpho-carbolates, cresol, and the phenol derivatives used in dyeing, picric acid, and aurine. The latter establishment displayed not only the common crystallized form of carbolic acid, but also the same in loose crystalline flocks, of absolute purity and dryness.

Orcine, which will be noticed in connection with the coloring materials, was to be found among the substances exhibited by A. Poirrier, of St. Denis, the house of which M. Poirrier is now the representative having originally been established, in 1824, for the manufacture of lichen colors.

5. ORGANIC ACIDS AND THEIR SALTS.—Oxalic acid of excellent quality was exhibited by two of the German firms which have made their country independent of England for this material by adopting the simple and admirable process of Dale, of Manchester,—the model of a chemical manufacturing method,—by which the acid is obtained from saw-dust by heating with caustic potash, the alkali being continually recovered. Dale has lately improved his original method by patenting a preliminary purification of the cellulose of saw-dust by treatment with alkaline lye. The older uses of this acid have been added to by its employment in making orange and red coralline. Tessié du Motay has proposed, in France, to use as material for making the acid the press residue of beet-root from the sugar-factories.

The most important novelty in this department of chemistry since the Vienna Exhibition is artificial salicylic acid, prepared under Kolbe's patent, from phenol, by heating it together with sodium hydrate, and passing over the mixture at 185° to 200° C. a stream of carbon dioxide gas, giving sodium salicylate,—



which is dissolved in water and precipitated by a mineral acid, the precipitated salicylic acid being afterwards purified by crystallization from water or sublimation in a current of superheated steam. The value of this substance is attested by the extent and variety of the uses it has already been put to,—as an antiseptic addition to the dressings for wounds and sores; as a gargle in diphtheria; for internal use in the medical treatment of acute rheumatism, the premonitory stages of typhoid fever, and other diseases; in veterinary practice; as a mouth-wash and dentifrice; in the preservation of meat, fruit-jellies, milk, butter, and eggs; as the means of regulating the fermentation

of wine, beer, etc.; in connection with glue-making, tanning, and other of the useful arts. The acid, both crude and purified, and several of its salts, were exhibited at Philadelphia by the original maker on the large scale, Dr. v. Heyden, of Dresden; and by the Berlin Joint-Stock Chemical-Factory (Schering). A similar exhibit was made by the United States Salicylic Acid Works, of New York, an establishment lately set on foot to manufacture under the Kolbe patent in America.

The sulpho-carbonates, which, in pursuance of Prof. Dumas' suggestion, have been largely used in European vineyards in combating the ravages of the *phylloxera*, were to be found among the products shown by J. F. Heyl & Co., of Martinickenfelde, near Berlin (long occupied with the manufacture and use of carbon disulphide), H. Trommsdorff, and Th. Schuchardt; as also the alkaline xanthates (ethyl-disulpho-carbonates) and amyl-xanthates (amyl-disulpho-carbonates), more recently introduced for the same purpose. These salts deserve careful trial in America in districts suffering from the Colorado beetle, against which they are said to be efficient.

6. ALKALOIDS.—As regards the finer chemicals, the United States nowhere appeared to so great advantage as in this branch of manufacture. The productions of Messrs. Powers & Weightman and Rosengarten & Sons, both of Philadelphia, obtained marked approval at the hands of foreign chemists. With the former firm, the manufacture of sulphate of quinine and sulphate of morphine holds the chief place, and of these large masses were shown in finely-crystallized condition. This firm has also made active exertions to introduce into general use the less commonly employed cinchona alkaloids, whose value in malarial fevers the results published by the Madras medical officers a few years ago did much to establish in medical confidence; and of the sulphates of quinidine, and especially cinchonidine, there were large and fine exhibits made. The other salts of the Peruvian bark bases were shown in great variety and splendid condition, citrate of quinine and acid sulphate of cinchonine, the latter in great glassy crystals, being particularly noticeable. The alkaloid morphine itself, narcotine, codeine, and a great cake of snow-white, silky caffeine were all worthy of attention. Rosengarten & Sons had sulphates of quinine, quinidine, cinchonidine, and morphine on a similar scale and in beautiful condition.

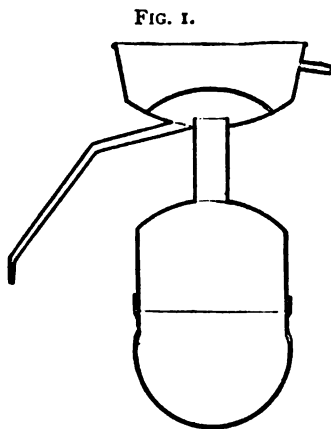
In the German section, the well-known house of F. Jobst, of Stuttgart, had a much smaller but very interesting collection of alkaloids, including several but rarely seen,—*e.g.*, chinamine, from East Indian cinchona bark, echitine, echiteine echicerine from dita bark, cotoine

from coto bark, laudanine, meconine, pseudomorphine, and thebaine from opium, etc.

T. & H. Smith & Co., of Edinburgh, Scotland, sent some other rare alkaloids and alkaloidal salts, including codeine, sulphate of thebaine, in a large crystalline cake, papaverine, hydrochlorate of cryptopine, conhydrine, very nearly colorless conine, atropine, and the artificial base furfurine, etc.

In the section of the Netherlands, A. J. Rijk, of the firm of A. d'Ailly & Sons, of Amsterdam, exhibited some fine specimens of the salts of quinine, cinchonine, and the mixed alkaloids from cultivated cinchona bark of Java; the barks themselves from the Java plantations being also shown by the Government of the Dutch East Indies.

7. NATURAL MATERIALS USED AS PERFUMES.—Among these, essential oils of course hold the first place. Numerous specimens were exhibited from foreign countries, and some American; only a few of the more remarkable require special notice. Turkey had several exhibitors of oil (otto) of rose, of whom D. Pappazoglou Bros., and H. A. Holstein, both of Constantinople, sent the finest samples, produced mainly in the valley of Kézanlik, in the southern part of Roumelia. A very fragrant specimen which I examined began to solidify at  $20.2^{\circ}$  C. The total annual production of Turkey (in Roumelia) is reported as on an average 3500 pounds, but varying much with the season; it rose to 6000 pounds in 1866, and fell to 1700 pounds in 1872. The oil of rose geranium, which is much used to adulterate genuine rose oil, was also shown. Hamooda Azuz, of Tunis, exhibited ottos of rose and jasmine; and in the collective exhibit sent by the Bey of Tunis was one of the small copper stills used in making otto of rose. This is shown in vertical section in Fig. 1; the body of the still was about 2 feet 4 inches high by 1 foot 6 inches in diameter. The same perfume was exhibited in the French section, but was of Turkish production.



In the very interesting collection from the Philippine Isles there were fine specimens of the essential oil of ylang-ylang (*Anona* or *Artabotrys odoratissima*), which seems to have been more abundantly produced since its comparatively recent introduction to Western commerce; it was reported as worth 2500 francs per kilo. in 1873 (H. Gal,

in *Comptes rendus*, lxxvi. 1482), while the price was stated at Philadelphia as 750 francs per kilo. Mexico sent delicately fragrant essential oil of lignaloes (from *Amyris lignaloes*) and of toronjil (from *Cedronella Mexicana*).

The essential oils from the *aurantiaceæ* were contributed in beautiful condition from Southern Italy, Ignazio Siles and Felice Lacaria, of Reggio, sending several excellent specimens.

Eucalyptus oil, used not only in medicine, but to mix (often as an adulterant) with other oils in perfumery, was shown in the collections of the Australian colonies. Most of it was from *Eucalyptus globulus*, as was a specimen contributed from Mexico from the acclimated tree, but among the specimens from Victoria were oils from two or three other species of the same genus.

Of "atturs" in the proper Eastern sense of the term, *i.e.*, bland fat oils impregnated with perfume, there were examples from the Philippines of sampaguita and champaca. In regard to the latter a little mistake seems to have crept into the last syllable in the names of the perfume and of the plant whence it is derived (*Michelia champaca*); on a specimen of the perfume which I received some years ago from India the Hindustani label in English characters reads Champa-ka-attur, in which *ka* is simply the sign of the genitive case.\*

Of similar character were some of the fine perfumes prepared by *enfleurage*, exhibited in the French section by Antoine Chiris and Roure-Bertrand, Fils, of Grasse (Alpes maritimes). The perfumed pomades of the latter were free from all trace of rancidity, but entire immunity from such change is secured by the substitution of solid paraffine for fat, which the former illustrated. The new highly-concentrated essences of violets, jasmine, tuberose, etc., contributed by Roure-Bertrand were doubtless the most costly perfumes in the Exhibition, the essence of violets being worth 1600 francs per kilogramme.

Orange-flower-water of unusual excellence was sent from Spain.

There was a handsome display of vanilla contributed from Mexico by several exhibitors, that of Señor José B. Silvera, of Vera Cruz and Papantla, being probably most fragrant and richest in vanilline.

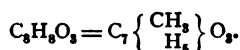
Of animal perfumes, the most notable exhibit consisted of several fine lumps of crude ambergris—one or two nearly, or quite, as large as a man's head—in the collection of perfumery of Young, Ladd, & Coffin, of New York.

8. ARTIFICIAL PERFUMES.—The one remarkable advance in this direction since 1873 has been the artificial production of vanilline, identical in composition and properties with the essential constituent of the natural vanilla-pod. Coniferine, a glucoside occurring in the

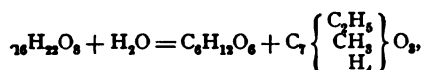
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\* See note on page 120.

cambium or sap found in spring between the sap-wood and inner bark of pine-trees, was first examined by Kubel and Hartig. F. Tiemann and W. Haarmann ascertained, in 1874, in the Berlin laboratory that this substance heated with dilute sulphuric acid, or better, with an oxidizing agent also added, yields a colorless material capable of crystallizing in fine needles with a strong vanilla odor, and having in fact the same properties and giving the same results on analysis as the crystalline efflorescence which makes its appearance on the surface of vanilla-pods when kept for a length of time in close vessels. Further experiments go to show that this vanilline is a methyl aldehyde of proto-catechuic acid,—



The original coniferine ( $C_{16}H_{22}O_8$ ) assimilating the elements of water, splits up first into glucose and a substance having the composition  $C_{10}H_{12}O_3$ , which appears to be the ethyl-methyl ether of proto-catechuic aldehyde,



and the action of oxidizing agents upon this converts it into vanilline. The patent taken out by Dr. W. Haarmann for manufacturing the latter on a commercial scale directs that a lukewarm mixture of 10 parts potassium bichromate, 15 parts sulphuric acid, and 80 parts water be poured in a slender stream into a solution of 10 parts coniferine in hot water, and the whole be then kept at a boiling temperature for about three hours. The vanilline is afterwards to be extracted with ether, or separated by distillation with the vapor of water. The patentee exhibited at Philadelphia, in the German section, coniferine, vanilline, and mixtures of the latter with various diluents—alcohol, glycerine, and sugar—for the use of perfumers, confectioners, manufacturers of chocolate and liqueurs, etc.

Analysis having shown that the average amount of vanilline in natural vanilla of good quality does not exceed about two per cent., the artificial flavoring principle in its pure state represents fifty times its weight of the pods.\*

Another artificial perfume, the so-called "Niobe essence," consisting of methyl benzoate, was exhibited by Dr. Wilhelmi, of Leipzig.

9. PIGMENTS OF ORGANIC ORIGIN.—Under this head the handsome display of "India ink" from China and Japan was worthy of notice. The finest "imperial" ink from the factory of Hu K'aiwên, at Hweichow-fu, province of Anhwei (west of Shanghai), was put up in box within box of lacquer-ware and elaborate silk wrappings, and

\* See note on page 120.

was rated at a price equivalent to about \$140.00 per kilogramme, but the cheapest kinds are sold at a far lower price. There is some real difference apparent, on examination, in the color and fineness of subdivision of the carbon, and probably in the purity of the gelatine used, but to a large extent the value set upon the finer kinds is obviously factitious, depending upon the addition of perfumes, fine moulding and gilding of the cakes of ink, etc.

The Japanese Sectional Catalogue says of the manufacture,—“The body of the ink is soot, obtained from pine-wood or rosin, and lamp-black from sesamum oil for the finest sort. This is mixed with liquid

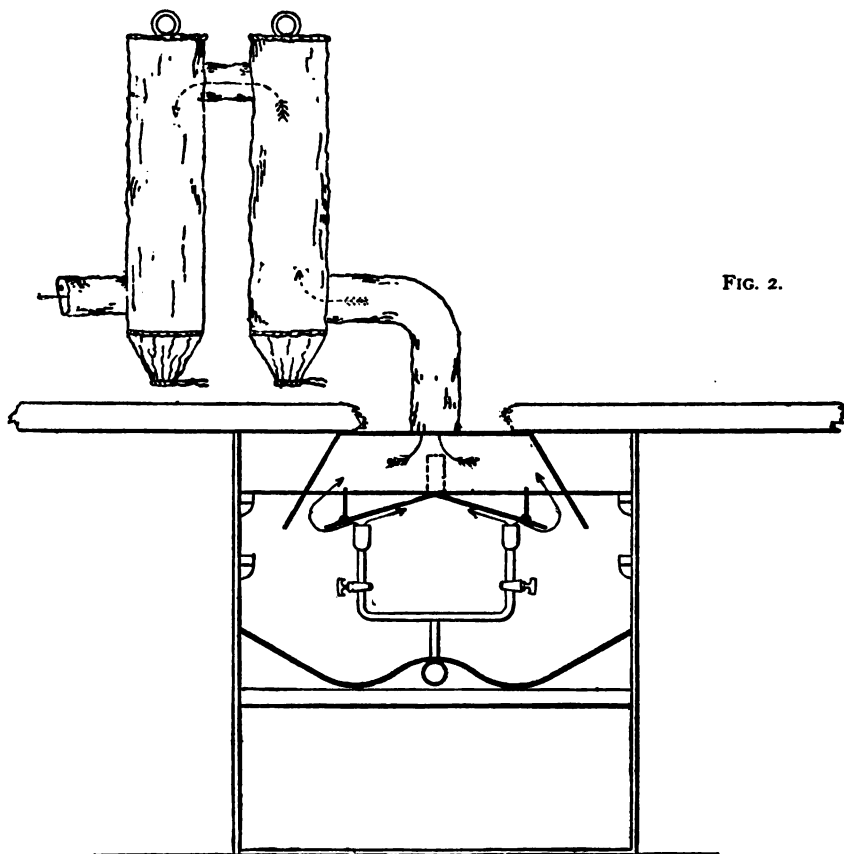


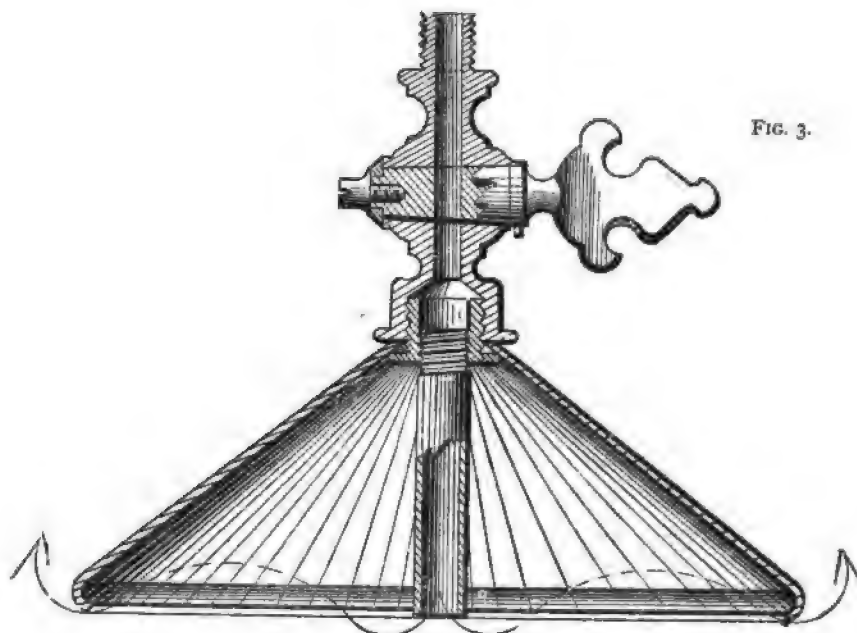
FIG. 2.

LAMP-BLACK APPARATUS.

glue made of ox-skin. This operation is effected in a large, round, copper bowl, formed by two spherical calottes, placed one inch apart, so that the space between can be filled up with hot water to prevent the glue from hardening during the time it is mixed by hand with

the lamp-black. The cakes are formed in wooden moulds, and dried between paper and ashes. Camphor, or a peculiar mixture of scents, which comes from China, and a small quantity of carthamine (the red coloring substance of safflower), are added to the best kinds, for improving the color as well as for scenting the ink. There is a great difference both in price as well as in quality of the various kinds of ink, the finest article being rather costly. The most renowned manufactory is in Nara, the old capital of Japan, in the province of Yamato."

One of the more interesting of the minor American exhibits consisted of the fine lamp-black which has for about two years past been made at Gambier, Ohio, by imperfect combustion of the natural gas which occurs throughout the petroleum region, and which frequently escapes in such quantity from borings, yielding little or no mineral



GAS-BURNER FOR THE MANUFACTURE OF LAMP-BLACK.

oil, as to give rise to the term "gas well." There are two such wells in Knox County, Ohio, near the junction of the Kokosing and Mochican Rivers, affording very large quantities of hydrocarbon gas, which Mr. Peter Neff, of Gambier, has utilized in the manufacture of lamp-black, which he calls diamond black. He has patented and uses several kinds of apparatus for burning the gas; two of the principal forms are shown in Figs. 2 and 3.

In the former of these, upright burners deliver the gas beneath an





This material is sold to makers of fine printing and lithographic ink in the United States, and has been sent in small quantity to Europe. It deserves to become more widely known.

10. NATURAL DYE-STUFFS FROM THE VEGETABLE KINGDOM.—In this class of materials the general display was very poor, but there were a few things of interest.

Thus, from Japan (Y. Wada-Tokio) there came one sample of remarkably fine, light, coppery indigo, with some of the dried leaves used in making it. There were also samples of African indigo from wild plants (not botanically determined) of Angola and of Liberia, in the former case accompanied by fragments of the leaves.

There was a little indigo from Mexico, from Java, and from the Philippine Isles, including a sample from the last in the state of undried paste.

In the large and interesting collection of products of the Portuguese colonies there was a fine series of color-lichens, chiefly from Angola, the Cape Verde Islands, and the far eastern island of Timor.

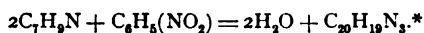
In the French section, Coez & Cie, of St. Denis, exhibited an excellent assortment of dyeing extracts, as those of logwood, Brazil-wood, sapan-wood, quercitron, weld, fustic, etc., with lake colors from the same sources.

11. NATURAL DYE-STUFFS FROM THE ANIMAL KINGDOM.—Among the Spanish colonial products there was some fine cochineal from the Canary Isles; a series of samples illustrating the different grades, and the different conditions under which the insects had been dried, was sent by Rafael Almeida Mateos, of Las Palmas, Gran Canaria.

12. ARTIFICIAL DYE-STUFFS.—Of these brilliant and beautiful products there was a fairly handsome display by a few—chiefly German and French—exhibitors, but the great scale upon which they are now made cannot be said to have been illustrated, and there was no novelty comparable in importance with the first aniline colors at the London Exhibition of 1862, or the artificial alizarine of 1873 at Vienna. One very beautiful new color—eosine—deserves indeed special mention, but progress has chiefly been made of late in the direction of simplifying the processes of manufacture, reducing the cost and diminishing the danger of production to the artisan and use to the consumer.

A.—In relation to the benzole and toluole colors, the Exhibition gave evidence of the thorough establishment on the great scale of the process for making fuchsine or aniline red without the use of arsenic acid, whose poisonous character was a constant source of embarrassment in the disposal of the residues of the manufacture and

involved great risk in the numerous applications, often in ignorant hands, of the color itself, which practically always retained more or less arsenic. The reaction now extensively used for the production of fuchsine, the starting-point for many other colors, consists in heating together the aniline oil of higher boiling-point, rich in toluidine, with nitrobenzole,—



The Joint-Stock Company for the Manufacture of Aniline Colors, of Berlin, having two factories, one at Rummelsburg, the other at Wiesenufer, exhibited both in crude and purified condition aniline red, to which the trade name "Rubine" has been given, made by the above process, the use of arsenic acid having been entirely abandoned.† Among the other specially interesting articles in the very fine exhibit of this company were free rosaniline (base) for use in making the finest aniline blues, "aurantia,"—a new product of this firm, of beautiful golden-yellow color, said to be hexnitro-diphenylamine,—phosphine orange, gentiana blue, and the fatty acid preparations of the aniline colors, miscible with oil, and intended for use in making varnishes, lacquers, ink for chromo-lithography, etc., this last class of products being a new specialty of the firm.

In the collection of Fr. Bayer & Co., of Barmen, among other aniline dyes were to be noted as comparatively new diphenylamine (phenylaniline) blue, and "Vesuvine," like "Bismarck," a brown color developed by exposure to the air of phenylenediamine from the action of reducing agents on dinitrobenzole.

Gans & Leonhardt, of Mainkur, near Frankfort-on-the-Main, who still use arsenic acid, which they make themselves to the extent of 5000 kilogrammes per day, had a number of the aniline colors in handsome condition, but nothing, I believe, specially new.

In the French section, the tastefully-arranged collection of beautiful products from the factory of M. Poirrier, of St. Denis, was well worthy of attention. The important advances in the manufacture of aniline colors which have been successively made at this establishment were illustrated by—(a) the methyl and di-methyl anilines, made by heating under pressure aniline chlor-hydrate and methyl alcohol, to be used, *after* the alcoholic radical has thus been introduced, in the production of aniline violet of various tints; (b) the benzyl-chloride used in producing the beautiful "*violet de Paris*;" (c) beside the methyl and

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\* Or, with like result, heating together aniline, toluidine, and nitrotoluole; one molecule of each. Couper's process, first in order of time, involved the use of aniline, nitrobenzole, iron, and hydrochloric acid.

† See note on page 120.

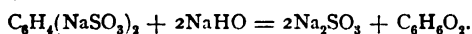
benzyl violets themselves, the night-green ("*vert lumiere*") made without iodine by heating methylic salts of the cheaper mineral acids with methyl-aniline violet, a process which has liberated large amounts of iodine and tended to keep down the rapidly-rising price of this substance, so important in medicine and photography. In the same case was to be found safranine of great beauty, a delicate and difficult color to make, and one which has in large measure replaced upon silk the natural dye-stuff safflower.

The recurrence of the terrible explosions which methyl nitrate, largely used by M. Poirrier, on more than one occasion gave rise to, has been prevented by the substitution of methyl chloride, or a mixture of hydrochloric acid and methyl alcohol.

Max Singer, of Tournai, in Belgium, had also some good aniline colors, including fuchsine made without arsenic; and Bindschedler & Busch and Durand & Huguenin, both of Bâle, represented Swiss industry in this department, though their exhibits were remarkable principally for dyes of other series.

B.—In the class of colors from ordinary phenol or carbolic acid, England, whose coal-tar dyes were almost entirely unrepresented, sent some picric acid and aurine or coralline from the factory of F. C. Calvert & Co., of Bradford, the latter both in cake form and crystallized. It is interesting to notice that this substance, aurine, in impure form gave Runge, as early as 1834, what seems to have been the first glimpse of the future use as dye-stuffs of the coal-tar derivatives. He says\* of his *rosolic acid*, "It gives with suitable mordants red dyes and lakes which for beauty may be placed beside those from safflower, cochineal, and madder." Picric acid and coralline were also exhibited by more than one German manufacturer.

The chief tinctorial novelty since 1873 has been already mentioned—"eosine" (red of dawn), a derivative of the diatomic phenol resorcin (C<sub>6</sub>H<sub>4</sub>O<sub>2</sub>). This latter substance, originally obtained among the products of decomposition of certain gum-resins, such as galbanum and ammoniacum, is now artificially made by passing the vapor of benzole into heated fuming sulphuric acid, producing disulpho-benzolic acid, C<sub>6</sub>H<sub>4</sub>(HSO<sub>3</sub>)<sub>2</sub>, the sodium salt of which is fused with sodium hydrate,—

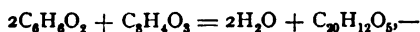


Another source is to be found in the dry distillation of bresiline, the coloring matter of Brazil-wood, giving rise to the hope that, as pointed out by V. Wagner,† we may yet see this, and probably the

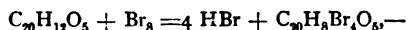
\* *Pogg. Ann.* (1834), xxxi. 70, quoted in V. Wagner, *Jahresb.*, 1872, 681.

† *Chem. Centralb.*, 29th Dec., 1875, S. 827.

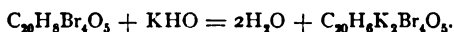
hæmatoxyline (rather from pyrogallol?) of logwood, artificially reproduced. Resorcline heated with phthalic anhydride gives fluoresceine,—



one of a class of substances discovered by Ad. Baeyer, and remarkable, as its name implies, for exhibiting in alkaline solution a brilliant green fluorescence. Acted upon by bromine, this substance yields a tetra-substituted derivative,—



and this with potash finally the di-potassium compound, which is eosine,\*—



By varying the extent of bromination, the tint of the product may be made to range from the scarlet to the crimson side of red. The normal color is a beautiful rose to aurora red, with vivid orange fluorescence in solution. The rose color upon silk, lovely by daylight, assumes a more strongly marked orange character by artificial light. There has been some difficulty in securing firm attachment to the tissue in dyeing, but it is stated that this has been to a large extent overcome for the animal fabrics.

Although so recently discovered, eosine was exhibited at Philadelphia by several firms,—Poirrier, Berlin Joint-Stock Company, Bayer & Co., Gans & Leonhardt, Max Singer, Durand & Huguenin, and Bindschedler & Busch. The last named had also a specimen of an ether (ethylic, I believe) of tetrabrom-fluoresceine. C. F. Siepermann, Sohn, of Elberfeld, exhibited on wool the colors produced with eosine, which he calls "Bismarck rosa" and "Kaiserroth," or Imperial red.

From the triatomic phenol, pyrogallol, or pyrogallic acid, another of Baeyer's phthaleines of tinctorial value has been obtained, namely, galleine, affording colors on cloth like those given by logwood and barwood. Of this, in the condition of a liquid paste, there was a specimen in the collection sent by Durand & Huguenin, of Bâle.

Among the most recent results of synthetic chemistry has been the artificial production of orcin, the immediate source of the chief coloring matter of archil, cudbear, etc., long manufactured from cer-

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\* The history of the manner in which Prof. Hofmann, the father of artificial coloring materials, succeeded in unraveling the proximate composition of eosine when presented to him from an unknown source, with no information as to the method of manufacture, and then succeeded in reproducing it, furnishes a striking proof of the progress made in generalizing our knowledge as to the constitution of organic substances.

tain lichens. Chlor-toluole is heated for several hours with sulphuric acid, yielding two isomeric forms of sulpho-chlorocresylic acid, which are separated by fractional crystallization of their barium salts. The less soluble salt gives by double decomposition the corresponding potassium compound, and this on fusion with potassium hydrate yields among other products orcin, to be washed with benzole and crystallized from ether.\*

Orcin was exhibited by M. Poirrier, but derived, doubtless, from its natural source, the coloring lichens.

C.—Naphthaline colors were to be found in two or three of the collections on exhibition. In that of the Berlin Joint-Stock Aniline Company was presented the brilliant Martius yellow (dinitro-naphthol-calcium or sodium), discovered some years ago by Dr. C. A. Martius, one of the directors of this establishment. Max Singer, of Belgium, had a jar of fine naphthaline blue.

D.—The greatest achievement probably of tinctorial chemistry, artificial alizarine, made from anthracene, reproducing the chief coloring matter of madder, and rapidly replacing natural madder in the hands of dyers and calico-printers, was handsomely exhibited in various tints and in various degrees of commercial purity by Fr. Baeyer & Co., of Barmen, and on a smaller scale by Bindschedler & Busch, of Bâle. In the Austrian section, Przibram & Co., of Vienna and Königsberg, in Bohemia, contributed a suite of large and handsome specimens illustrating the production of artificial alizarine; the anthracene, anthrachinone, sulphanthrachinonate of sodium, and alizarine itself being shown crude, in a state of commercial purity, and chemically pure, or nearly so. A large jar of sublimed alizarine in brilliant orange-red needles, but sadly packed together by traveling, ended the series. The French firm of Thomas Frères, of Avignon, also sent some samples of artificial alizarine.

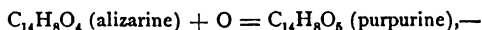
It is a pity that there were not more numerous specimens from different sources of crude anthracene, the hydrocarbon from which alizarine is made. The efforts of manufacturers for the last few years have been largely directed to increasing the supply and improving the quality of this material as delivered by the coal-tar distillers, and already much has been gained by these efforts. Anthracene is obtained in the last stages of the distillation of heavy creasote or dead oil, and in the early stages of the distillation of pitch; the temperature being so high and the material so thick, there is risk of much loss by irregular overheating, and it has been found that an improved

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\* Vogt & Henninger, *Comptes rendus*, lxxiv. 1107.

yield is secured by keeping the contents of the still agitated and distilling in a current of indifferent gas. It being well ascertained that the character of tar varies decidedly with the kind of coal originally used in producing it, in view of the increasing importance of this at one time waste product of coal-gas manufacture, it would seem worth the attention of the managers of gas-works in selecting their coal to study not only its gas-producing, but also its special tar-producing capability. The methods of testing the value of crude anthracene, which is still very variable in character, and of purifying it before its conversion into alizarine, have also received much notice within the last two or three years.

Since the date of the Vienna Exhibition, when alizarine from coal-tar was first displayed, the associate of this substance in madder, purpurine, has also been artificially produced. The difference between the two involves but an atom of oxygen,—



and the latter has been produced by F. de Lalande\* by direct oxidation of alizarine with sulphuric acid and manganese dioxide, or arsenic acid. Reducing agents, curiously enough, do not reproduce alizarine, but the isomeric substance purpuro-xanthine (practically valueless in dyeing), while either of these by re-oxidation will give purpurine. Our knowledge of the isomeric and closely allied coloring substances occurring with alizarine and purpurine in madder and in artificial alizarine has been largely added to of late by the researches of Perkin, Rosentiehl, Schützenberger, and others. There was no specimen of Perkin's anthrapurpurine among the English chemicals.

The commercial importance of the discovery of artificial alizarine has been long beyond dispute, and is strikingly illustrated by the statements which have been published, that the average annual importations of madder and its purified form, garancine, into Great Britain were, prior to this discovery, in round numbers 15,300 tons and 2300 tons respectively, as against 5000 and 1300 tons in 1875, and 3700 and 800 tons, estimated in 1876; the money cost of the two imports in this last year being only about £140,000, while formerly it represented about £1,000,000.

It has been calculated that alizarine equivalent to 50,000 tons of madder is now manufactured annually, while the whole crop of the natural root in all madder-producing countries was, prior to 1868, but about 70,000 tons.

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\* *Comptes rendus*, lxxix. 669 (1874).

E.—Another novelty brought into industrial use since 1873 is the class of colors discovered by Croissant and Bretonnière, produced by heating various waste forms of cellulose, such as saw-dust, spent dye-woods or tan-bark, paper refuse, etc., with caustic alkalis and sulphur in close vessels. The sulphuretted products obtained afford very cheap and remarkably fast colors, both upon animal and vegetable fabrics. In dyeing the former, neutralization of the alkali is alone required. On cotton goods, for which these dyes are specially adapted, no true mordant is required, but the colors are generally fixed with potassium bichromate. Various tints may be produced of brown, drab, fawn, gray, lavender, etc., none of them very brilliant, but of useful character, and serving well to modify some of the aniline colors and indigo.

These dyes were exhibited by M. A. Poirrier, under the name "Cachou de Laval"; he manufactures them under the French patent of the discoverers. As "patent colors (organic sulphides)" similar products were shown by Przibram & Co., of Austria.

In connection with the artificial coloring materials themselves, handsome series of specimens were presented by most of the exhibitors of the results obtained therefrom in dyeing upon silk, wool, and cotton, in the form both of yarn and cloth.

13. RAW ORGANIC SUBSTANCES, NOT ALREADY NOTICED, AS SPECIMENS OR MATERIALS FOR CHEMICAL RESEARCH.—Of these some examples were presented in the cases of several of the more important exhibitors.

In the collection sent by Trommsdorff, of Erfurt, some of the physiological preparations were deserving of attention.

Among the chemicals of Dr. Schuchardt, of Görlitz, were noticeable thymol, phenanthrene, azobenzole in splendid red crystals (also shown by Kahlbaum), salts of mellitic acid, and platino-cyanides of some of the rarer metals. The crystals of yttrium platino-cyanide were true chemical gems, some of them as much as five-eighths of an inch through and magnificently trichroic, deep crimson-red by transmitted light, and reflecting a brilliant green from one set of faces and violet-blue from another.

The most interesting thing in the American section was a fine collection of the products of coal-tar distillation and their derivatives, contributed by Page, Kidder, & Fletcher, of New York, including many substances not to be found in commerce, and rarely seen in a state approaching purity, such as the bases picoline, pyridine, collidine, lutidine, etc.



In conclusion, it may be said of the Exhibition in the industrial field to which these notes refer, that the more refined chemical manufactures are too little advanced to permit the United States to make much display except in a few directions, while in these this country was very creditably represented; that England contributed nothing at all worthy of her reputation and real ability; that the same was to a large extent true of France, although she had one or two most honorable representatives; that Germany incompletely but yet handsomely illustrated the intelligence, activity, and enterprise that characterize her chemical manufactures; and that other countries, as Austria and Switzerland, sent but scattering, though in some cases valuable contributions.

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NOTE TO PAGE 108.—In a report by Dr. M. C. Cooke on the gums, resins, etc., in the India Museum, London, received since the above was written from Dr. Forbes Watson, Director of the Museum, on page 20, I find Champa and Champaca both given among native names for the plant.

NOTE TO PAGE 109.—The interesting announcement has been made by K. Reimer (*Ber. d. deutsch. chem. Gesellsch.*, 1876, S. 423), that vanilline can be artificially produced from the guaiacol of beech tar.

NOTE TO PAGE 114.—Dale and Schorlemmer (*Proc. Chem. Soc. Lond.*, June 7, 1877) have lately announced the production of rosaniline (fuchsin) by the action of aqueous ammonia at 120° on aurine.

## PETROLEUM.

BY J. LAWRENCE SMITH.

It is with some reluctance that I undertake this report on petroleum; but from the fact that, so far as the industry and commercial supply of petroleum is concerned, the world looks to America for it, and especially to the great State in which the Centennial Exhibition was held, I have undertaken to make a full report of this material in all its bearings, gathering my facts from a great number of scattered sources. Almost everything that is known about petroleum in connection with the theory of its formation or the chemistry of the various substances forming this curious mineral product is of a very vague character. That it is a substance entirely disconnected from the formation of coal is readily conceded by almost all, and that it belongs equally to the oldest Silurian and most recent Tertiary and all intermediate ages; yet how it was formed—whether from vegetable or animal products or from both—is not yet solved. Its chemistry is equally obscure,—for while we obtain by fractional distillation a variety of hydrocarbons, we do not know if these distillates exist ready-formed in the petroleum, or which of them are produced by the process denominated cracking, no investigation having yet been made and persistently carried out to discover what are in the petroleum before heat is applied. Proper methods of procedure in this line of investigation have never yet suggested themselves to any chemist; yet, unpromising as the subject is, I shall not shrink from it, and only try and give such a summing up of our general knowledge of the subject as is possible with the resources at my command. There is no lack of literature on the subject, but it is so scattered and indefinite that it becomes a laborious task to make much out of it.

In most that I say in this report I shall have to draw largely upon the labors of many of my scientific friends, who have assisted me by their published and unpublished labors. Among them I would enumerate Profs. Benjamin Silliman, C. M. Warren, Saint Claire Deville, J. T. Henry, T. S. Hunt, C. F. Chandler, Henry Morton, E. B. Andrews, S. F. Peckham, S. Dana Hayes, and others.

## TRUE POSITION OF PETROLEUM.

This wonderful substance would properly belong to a report under the head of mineral products, did it not owe its great practical value

to important artificial processes of a more or less chemical nature. In the form under which it first presents itself to us, its application is quite limited, and it is principally from its unfitness for use in its natural condition that a substance so long known should, as it were, run to waste over the vast fields, ponds, and lakes that are sometimes coated with it. In such a report as this it would be waste of words and time to dwell on its distribution over the surface of the globe, for we are writing more for practical ends than for popular instruction.

#### HISTORY OF PETROLEUM IN AMERICA.

While specimens of this substance and its various products were exhibited at Vienna by different countries, there was but one country which commanded any pre-eminence, and that was North America; and as the great bulk of petroleum used in all parts of the world comes from this country, we will confine ourselves principally to the product as it occurs here, and to the industry as it is carried on in this country, leaving any general remarks concerning its distribution in other parts of the world to the conclusion of the report.

The aborigines of North America—the Indian tribes—were acquainted with petroleum, for in many parts of Western Pennsylvania and Virginia it flowed from crevices in the rocks, covering springs and lakes, and the Indians used it to mix with the pigments with which they colored their skins,—the painted designs becoming more permanent when the petroleum evaporated from the surface; they also used it in certain forms of religious worship, as described by the French commander of Fort Duquesne, in 1750, who was invited to assist at one of these ceremonies. And from that time to the present this hydrocarbon has been known in Western Pennsylvania, Virginia, and other parts of the United States. It has been found solid, liquid, and gaseous. In the gaseous form it received its earliest application, and wells sunk for salt-water in New York and Virginia would often have the gas accompanying the flow of water, and by a simple device the water was made to flow inside of the evaporating-pan and the gas to flow beneath the boiler, where it was ignited, and furnished ample fuel to evaporate the water and thus furnish salt with but little labor and at a very cheap rate. At Malta, Morgan County, Ohio, salt-works have been operated by this natural gas for thirty years, furnishing fuel for the pumping-engine and for evaporating the water, and at other places in Ohio small towns are lighted and warmed by the gas supposed to come from bituminous shales.

## DISTRIBUTION IN AMERICA.

In a large part of the United States west of the Appalachian range petroleum has been discovered in greater or less quantity, ranging through New York, Pennsylvania, Ohio, Virginia, Kentucky, Tennessee, Indiana, and Illinois. It is, however, in Pennsylvania, Ohio, Virginia, and Kentucky that petroleum has been extracted for uses in commerce. I should not, however, omit to state that it occurs farther north in large quantities, viz., in Canada, whence much of it is sent into commerce.

## THE OIL-FIELD IN PENNSYLVANIA.

This is the largest and the most important to the commerce of the world. The centre of the petroleum district in Pennsylvania is Venango County, long.  $79^{\circ} 45'$  W., lat.  $41^{\circ} 25'$  N., and the first full and complete description of the oil from this region was published in 1855, by Prof. B. Silliman, whose report was exceedingly interesting, and in some particulars gave us as complete information as we have ever obtained since. The oil districts in Pennsylvania may be considered as represented by a surface of territory of 8000 square miles; the portion, however, that has been explored lies principally along the water-courses.

## OHIO AND VIRGINIA.

The oil-fields in these two States are not so extensive as those of Pennsylvania. They occur in counties not far from the Ohio River, as Athens, Morgan, and Noble Counties in Ohio, and Tyler, Calhoun, Kanawha, and four other counties on the Virginia side of the river. In the latter State the entire district producing the heavy lubricating oil so well known in Europe and America is only six miles in length by one mile in width, and the heavy oil is usually found at a depth of 600 feet, while it is necessary to bore to a depth of 1200 feet to obtain the light oils. I may here remark that, while the rule is far from being invariable, yet Ohio and Virginia are justly celebrated for the heavy petroleum called lubricating oil, their combined products of this oil in 1872 being over 50,000,000 litres. Perhaps the most curious deposit of petroleum is that in Ritchie County, West Virginia. It is a vertical seam of solid asphaltum, cutting the horizontal coal-measures of that district (4 feet 10 inches wide), and has been traced to a length of over 1000 metres. The asphaltum is pure and clear; it fills up a gash, as it were, in the horizontal layers, the walls of this gash being of a greenish-yellow sandstone. It is supposed by Prof. Lesley that it may represent the consolidated portion of petroleum

which came from a reservoir that may still exist below this asphaltum. Six hundred pounds of it, when distilled, yielded 165 litres of superior oil. I should state that the depth of this crevice is unknown, and at a greater depth than it has yet been explored it may get wider, but there is little doubt, as above stated, that it has for its source some immense subterranean lake or large opening into the lower measures of liquid petroleum, for numerous gas- and oil-springs in the neighborhood of this asphaltum dyke give evidence of the abundance of petroleum beneath the surface.

#### INDIANA, KENTUCKY, ETC.

Indiana and other States have been but imperfectly studied, owing to the abundance in other regions, which renders it unprofitable to explore and work them. Some few wells in Kentucky are worked with profit to their owners.

#### CANADA.

The western portion of Canada is where the petroleum is found, and I would here remark that in that country there are no coal-measures,—showing clearly, even if there were no other evidence, that coal has no connection with the formation of petroleum. The petroleum-yielding rocks differ materially from those of Pennsylvania, being principally limestone, and belonging to the very oldest limestones. The oil is found abundantly, is usually of an offensive sulphurous odor, but readily purified by well-known processes.

In the peninsula of Gaspi, which belongs to another and distant eastern basin, petroleum has been met with in a geological position a little lower than that of Western Canada.

#### THE GEOLOGY OF PETROLEUM.

Petroleum, in different parts of the world, is found issuing from rocks of very various geological formation of all ages, from the lower Silurian to the Tertiary; but I will only give a condensed statement of the geology of the petroleum formations as found in those parts of America where it exists most abundantly; but what exists here is not applicable to all the petroleum-fields in America, for some are post-Pliocene, as in California, others in the Corniferous limestone of Canada; in fact, it occurs in rocks of all ages from Laurentian to the most recent,—the Laurentian being one of the oldest Silurian rocks of North America, and for a long time supposed to be destitute of evidence of organic life, until the discovery of the curious fossil called *Eozoön*.

The following description applies specially to Pennsylvania, Ohio, and Virginia, and I am indebted to my friend, Prof. Andrews, for the aid furnished me in the matter. The names used descriptive of the rocks are those well known to geologists in connection with the rocks of the United States.

In Pennsylvania, the oil is found in several sandstone-beds belonging to the Waverly Chemung group of the Devonian formation. In Canada, liquid oil occurs in the lower and upper Silurian, being often found in drops in fossil coral,—the cavities of large *orthocerata* often hold several ounces,—also in the lower Devonian in Canada. The middle Devonian is supposed by many to be the source of the Pennsylvania, Ohio, and Virginia oils. Prof. Lesley, however, attributes much of the oil of Western Pennsylvania to the sub-Carboniferous.

A few details of the geological formation of the petroleum district of Ohio, as made out by Prof. Andrews, will give all that is possible for me to introduce in connection with this part of the subject:

In Ohio, in the Niagara limestone, petroleum is generally thick and tarry in the cavities of fossil shells, as if formed by chemical reaction from the soft parts of the animals. Andrews says he never found enough in the Niagara rocks to flow, and never any filling fissures, and no wells have been struck; he has seen similar tarry bitumen in the fossiliferous Corniferous limestone of Ohio, and in similar small quantities. The Ohio black slate (Huron slates of Dr. Newberry) contains some oil. This slate, on the Ohio River, near Vanceburg, is 320 feet thick, and contains by analysis from 8.40 to 10.20 per cent. of volatile matter, chiefly bitumen. This would give to the whole body of the black-slate bitumen enough for a seam of coal from 80 to 100 feet thick. In the slate are thin plates or disks of pure asphalt, black, and highly resinous and shining. They are spread in local blotches, as if pressed out of the slate in a viscid condition. They are sometimes an inch thick. Wells bored into the black slate have yielded small quantities of free oil. Numerous oil-springs are found in Scioto and Adams Counties, Ohio, in the bottom layers of the Waverly sandstone (which overlies the black slate), the oil evidently originating in the slate and intercepted by the layers of sandstone above. Some of these springs still flow, others have stopped, and the oil is inspissated, and coats the sandstone where it once dripped.

In the black slate are large hollow concretions or septariæ, which contain within crystallized calcite and shining globules of asphaltum.

We find in the slate scales of ganoid fishes and a few shells, *Discina* and *Lingula*; but as yet there have not been discovered traces of suffi-

cient organic matter to account for so much bituminous matter as the slate contains. The slate was once a vast mass of muck, so to speak, the organic matter, probably marine vegetable ferns, having become so completely macerated as to lose all traces of structure.

In the Waverly sandstone, about 140 feet above the base, is a stratum, 16 feet thick, of highly bituminous slate, which contains 21.40 per cent. of volatile matter. This also contains remains of large fishes and scales of ganoids, and the same shells as the black slate below. This stratum is another source of oil; for the layer of Waverly stone just above it is often impregnated with oil, and sometimes in the quarries it fills cavities. Stones from these quarries, at Buena Vista and Rockville, Ohio, often drip with exceedingly thick oil. This may be seen in the piers of the suspension bridge at Cincinnati, Ohio.

#### HOW HAS PETROLEUM BEEN FORMED?

Before referring to the probable organic origin of petroleum, I will state the theory of the possible mineral origin of this substance as set forth by the distinguished French chemist, M. Berthelot (*Ann. de Chem. et de Phys.*, vol. ix. p. 482, 1866).

"The hypothesis recently put forth by M. Daubrée, that the terrestrial mass contains free alkali metals in its interior, joined to the experiments which I have lately made, leads almost necessarily to a mode of explaining the formation of hydrocarbons. In fact, the carbonic acid everywhere infiltrated into the crust of the earth, coming in contact with alkali metals, forms acetylides, according to my experiments. These same acetylides would result also from the contact of earthy carbonates with alkali metals even below a dull-red heat. Now these alkaline acetylides, once formed, may be subjected to the action of steam, and free acetylene would be the result if the products were immediately withdrawn from the influence of heat, hydrogen, and other matters present. But, on account of the conditions being different, the acetylene would not exist, as my recent experiments prove. In its place we obtain either products of condensation which approach the bitumens and tars, or the products of the reaction of hydrogen upon the matters already condensed,—that is to say, hydrocarbons more hydrogenated. For example, the hydrogen reacting upon the acetylene produces ethylene and hydride of ethylene. A new reaction of the hydrogen either upon the polymeres of the acetylene or upon those of the ethylene would engender formenic hydrocarbons such as constitute American petroleum. An almost unlimited diversity in the reaction is here possible, according to the

temperature and the bodies present. We can thus conceive the production by a purely mineral method of all the natural hydrocarbons, by the intervention of heat, water, and alkali metals. Lastly, the tendency of the hydrocarbons to unite together so as to form more condensed matter suffices to account for the formation of these curious compounds. This formation can also be effected in a continuous manner, since the reactions which produce it are incessantly renewed."

This theory, ingenious as it is, and apparently so plausible to the chemist, has too many difficulties in its way to be entertained for a moment by the geologist, who knows that the conditions asked for by the author must be miles below the strata in which the petroleum is found, and that we have already penetrated below the horizon at which petroleum has originated, and yet they have not touched the so-called primitive rocks, far below which we have to look for the conditions required by M. Berthelot. We have therefore to content ourselves in looking to the vegetable and animal matter of former geological epochs as the sources of this substance.

Some say petroleum is to be uniformly regarded as a product of decomposition of land or marine plants, especially the former; others, that it is produced from the decomposition of animal matter; others again, that it is a kind of coral oil, not formed from the bodies of the coral polyps, but secreted by the coral, principally of the Devonian age; others, that it is distilled from bituminous shales by subterranean heat, these shales being made up of the mud of lakes and estuaries that were once largely mixed with vegetable and animal debris. Doubtless the true solution of the problem is not to look to one source only for petroleum. That the primeval sources were both vegetable and animal there can be no doubt, and that the Pennsylvania and Virginia petroleums were derived almost exclusively from a vegetable origin; that those found in Canada and in some parts of Kentucky and Illinois were derived principally from animal matter. In some of these regions—as in Illinois and Kentucky—I have seen the coral limestone composed of numberless cells, in each of which is a minute globule of petroleum, but so hermetically sealed that while a few square miles of the rock and a few hundred feet in thickness really represent thousands upon thousands of millions of litres of petroleum, the particles will ever remain so subdivided that they will never be of any practical use to mankind. Where the petroleum is formed under such conditions that it can run together and fill crevices and cavities or become diffused through loose sand-rock, then it becomes available the moment these sources are tapped.



How the vegetable and animal matter is transformed into petroleum we do not yet know, further than the conditions of pressure and elevated temperature suffice to explain the change,—not that the entire matter is converted into petroleum, for that cannot be, but that a portion of it remains in the lower rocks in a form that cannot reach the surface, and when these rocks are exposed these residues show themselves in the form of carbonaceous matter mixed up with clay and sand and limestone, forming rocks more or less shaly.

The exact *modus operandi* of the formation cannot be perfectly understood; but the following summing up of the subject, embracing the views of Lesquereux, Lesley, Hunt, Bischof, and others, is taken from an able report of S. F. Peckham to the American Philosophical Society, made July, 1868, and given here in the language of the author.

It is assumed by Prof. Peckham, without asserting it to be a fact, that petroleum is the normal or primary product of the decomposition of marine animal or vegetable organism,—chiefly the former,—and that nearly all other varieties of bitumen are products of a subsequent decomposition of petroleum, differing both in kind and degree.

M. Lesquereux attributes its origin to the partial decomposition of low forms of marine vegetation, and Prof. Peckham is convinced that the remains of animal life have contributed much more largely to the formation of petroleum than has been generally supposed; and further, that the different varieties of petroleum are largely due to the varied forms of animal life existing during the different geological epochs to which the rocks belong from which the oil primarily issues. This latter idea was suggested by a remark of Dr. T. S. Hunt, when he says, "Their presence (that is, the petroleums of Pennsylvania and Canada) in the lower palæozoic rocks, which contain no traces of land plants, shows that they have not in all cases been derived from terrestrial vegetation, but may have been formed from marine plants or animals; the latter is not surprising when we consider that a considerable portion of the tissues of the lower marine animals is destitute of nitrogen, and very similar in chemical constitution to the woody fibre of plants."

This opinion is further strengthened and confirmed when we find in rocks of Tertiary age, in which fossil remains of the higher marine animals are found in abundance, a petroleum comparatively rich in nitrogen, of unstable constitution, and undergoing decomposition in a manner similar to putrefaction. Such is the character of the petroleum issuing from the Miocene of the Coast Range of Southern California and, from such meagre accounts as are accessible, it is inferred

that such are the characteristics of the petroleum of the Baker region on the shores of the Caspian Sea, issuing from rocks which are asserted to be also of Miocene age. If it be granted that a theoretical compound may be obtained from cellulose having an equal number of equivalents of carbon and hydrogen, the general formula for petroleum, the fact still remains that petroleum has never been observed under such circumstances as to leave no possibility of a doubt that it was derived from wood. The observations of Mr. J. P. Lesley are the most conclusive of any to be met, yet it appears that the facts as observed by him may be accounted for upon an hypothesis more in harmony with those connected with the occurrence of mineral oils in other localities. Several instances are cited by Bischof, in illustration of the fact that wood has changed to lignite during the historic period. The discovery of the piles driven in the Thames by the ancient Britons, and of timber in long-abandoned mines, both found in a carbonized condition, will serve as examples. Still more recent discoveries were made at Port Hudson, Louisiana, where wood bearing the marks of the axe was found in a sedimentary deposit of the Mississippi River in a carbonized or, as the writer expresses it, bituminized condition. It is therefore to be inferred that the formation of petroleum from woody fibre presupposes a peculiar decomposition under conditions so extraordinary as not to exist at present,—conditions, too, that, though possible during former geological epochs, were then by no means universal, as is proved by the fact that petroleum and coal alike occur in almost every formation from the Primary to the Tertiary, and often in close proximity to each other. The formation in Southern California, in which petroleum and other forms of bitumen occur in vast quantities, contains lignitic remains at rare intervals, proving that the conditions essential to the formation of lignite and petroleum were present at the same time.

The opinions entertained by M. Lesquereux, when applied to petroleum issuing from palæozoic rocks, are perhaps as little open to objection as any theory, but as a formula applicable to all conditions under which petroleum occurs they cannot be maintained. If petroleum were invariably derived from marine algæ, we should expect to find it identical in composition wherever found, as the conditions favorable to their growth and their composition are in all cases too nearly identical to admit of any marked variation in the products of their decomposition.

Too much has been assumed concerning the constitution of all petroleum from the researches of the few investigators who have

studied Pennsylvania petroleum. Because Messrs. Warren and Storer discovered that the same proximate principles exist in that portion of Pennsylvania and Rangoon petroleum boiling at or below  $200^{\circ}$  C., yet not in the same relative proportion, and not without admixture of different substances, it must not be taken for granted that all petroleum contains those principles. Very little is at present known concerning the more dense portions of Pennsylvania petroleum having boiling-points above  $200^{\circ}$  C., amounting to about 30 per cent. by measure. When this dense portion amounts in other petroleum to about 70 per cent., even should the lighter portions contain the same principles, the question of similarity between the two oils requires a comparison of the heavier quite as much as of the lighter portions.

The small proportion of nitrogen found in the petroleum of the palæozoic rocks of Pennsylvania and Canada might be derived from any source to which the origin of petroleum has yet been ascribed; but when we pass up from those early formations through the secondary rocks to the middle Tertiary, to a deposit rich in remains of the higher marine animals, in which cetacean bones are as frequently met as any other fossil, and find an oil comparatively rich in nitrogen, we are forced to admit that the conditions of such theories are less in accordance with facts.

The following very rational views of the changes of wood into hydrocarbon have been suggested by Prof. Hunt, starting out with woody fibre as composed of  $C_{24}H_{20}O_{20}$ :

I. When wood is exposed to the action of moist air, oxygen is absorbed, and carbonic acid water is evolved in the proportion of one equivalent of the first for two of the last. We may suppose that for  $H_2$ , which is oxidized by  $O_2$  from the air, the wood loses  $CO_2$ ; so while the carbon increases in amount, the proportions of oxygen and hydrogen are unchanged. In this way an equivalent of cellulose, by absorbing sixteen equivalents of oxygen and losing eight of carbonic acid ( $8CO_2$ ) and sixteen of water ( $16HO$ ), would leave  $C_{16}H_4O_4$ . Such is the nature of the decay of wood when exposed to the air, and the process, could it be carried out, would leave a residue of carbon only. If, however, the wood is deeply buried and excluded from the oxygen of the air, two reactions are conceivable.

II. The whole of the oxygen of the wood may be given off in the form of carbonic acid, while the hydrogen remains with the residual carbon. The abstraction of ten equivalents of carbonic acid from one of woody fibre would leave a hydrocarbon,  $C_{14}H_{20}$ .

III. Instead of combining exclusively with the carbon, a part of the

oxygen of the wood may be set free as water in the combination of the hydrogen. The abstraction from an equivalent of woody fibre of four equivalents of carbonic acid and twelve of water would leave a hydrocarbon,  $C_{20}H_8$ .

IV. These decompositions are, however, never so simple as we have supposed in II. and III., for a portion of hydrogen is at the same time evolved in combination with carbon, chiefly as marsh-gas,  $C_2H_4$ . The amount of this gas evolved from decaying plants submerged in water, and the immense quantities of it condensed in coal-beds and other rocky strata (forming fire-damp), show the great extent to which this mode of decomposition prevails.

The following results have been selected from a great number of analyses by various chemists, and are for the most part taken from Bischof's *Chemical Geology* (vol. i. cap. 15). The nitrogen, which in most cases was included with the oxygen in the analysis, has been disregarded, and the oxygen and hydrogen, for the sake of comparison, have been calculated for twenty-four equivalents of carbon :\*

1. Vegetable fibre or cellulose . . . . .	$C_{24}H_{20}O_{20}$ .
2. Wood, mean composition . . . . .	$C_{24}H_{18.4}O_{16.4}$ .
3. Peat (Vaux) . . . . .	$C_{24}H_{14.4}O_{10}$ .
4. " (Regnault) . . . . .	$C_{24}H_{14.4}O_{9.6}$ .
5. Brown coal (Schrotter) . . . . .	$C_{24}H_{14.3}O_{10.8}$ .
6. " " (Woskresensky) . . . . .	$C_{24}H_{13}O_{7.6}$ .
7. Lignite (Vaux) . . . . .	$C_{24}H_{11.3}O_{6.4}$ .
8. " passing into mineral resin (Regnault) . . . . .	$C_{24}H_{15}O_{3.3}$ .
9. Bituminous coal . . . . .	$C_{24}H_{10}O_{3.3}$ .
10. " " " . . . . .	$C_{24}H_{10}O_{1.7}$ .
11. " " " . . . . .	$C_{24}H_{8.4}O_{1.2}$ .
12. " " " . . . . .	$C_{24}H_8O_{0.9}$ .
13. " " (Kuhnert and Gruger) . . . . .	$C_{24}H_{7.4}O_{1.3}$ .
14. " " (mean comp.) (Johnson) . . . . .	$C_{24}H_9O_2 - O_4$ .
15. Albert coal (Wetherill) . . . . .	$C_{24}H_{15.9}O_{1.6}$ .
16. Asphalt, Auvergne . . . . .	$C_{24}H_{17.7}O_{2.2}$ .
17. " Naples . . . . .	$C_{24}H_{14.6}O_2$ .
18. " Bastennes . . . . .	$C_{24}H_{16}O_{0.7}$ .
19. Elastic bitumen, Derbyshire (Johnston) . . . . .	$C_{24}H_{22}O_{0.3}$ .
20. Bitumen of Idria . . . . .	$C_{24}H_8$ .
21. Petroleum and Naphtha . . . . .	$C_{24}H_{24}$ .

It will be seen that the final result of the third process of decomposition of woody fibre, in which, the air being excluded, the oxygen is shared between the carbon and hydrogen, would be  $C_{20}H_8$ . A similar result would be obtained with the simultaneous evolution of marsh-

\* NOTE.—The equivalents in this table are on the old system.

gas, if we suppose  $6\text{CO}_2 + 8\text{HO} + 3\text{CH}_4$  to be removed from an equivalent of woody fibre, leaving  $\text{C}_{15}\text{H}_6 = \text{C}_{20}\text{H}_8 = \text{C}_{24}\text{H}_{10}$ , which approaches the composition of most bituminous coals and of idrialine. A further elimination of marsh-gas would leave a residue of pure carbon, and thus, as Bischof has suggested, vegetable matters may be converted into anthracite without the intervention of a high temperature.

The elimination of the whole of the oxygen in the form of carbonic acid would leave a compound with a large excess of hydrogen, of which it would be necessary to remove a portion in the form of water or marsh-gas in order to reduce the residue to the composition of petroleum. We know of no combination of carbon and hydrogen in which the number of atoms of hydrogen surpasses by more than two those of carbon, the general formula being  $\text{C}_n\text{H}_{n+2}$ , so that oils like  $\text{C}_{18}\text{H}_{20}$  and  $\text{C}_{26}\text{H}_{28}$  contain nearly the maximum quantity of hydrogen, and a body like  $\text{C}_{14}\text{H}_{20}$ , whose formation we have supposed above, could not exist, but must break up into marsh-gas and some less hydrogenous oil-like petroleum.

#### ACCUMULATION OF PETROLEUM IN FISSURES.

Prof. Andrews has observed in Virginia and Ohio, and Prof. Hunt in Canada, that the accumulation of oils is intimately connected with the anticlinal disturbance in the rocks, and wells sunk in these anticlinals often give abundance of oil, especially where the fissures are most numerous, while no oil has been found in the horizontal rocks on either side.

In determining the origin of the oil in any given locality, however, we must always consider that the true source of it may not be in the rock which appears there at the surface, but in some underlying formation. Thus, in Western Pennsylvania and in Ohio, although natural oil-springs appear at the surface, many of the productive oil-wells are sunk to depths of several hundred feet in the great Devonian sandstone, which there attains a thickness of nearly 2000 feet. In other places in that region they are sunk in the still higher carboniferous rocks, which, in many parts, rest upon this sandstone. Coming northward into Canada, we find the oil-wells of Enniskillen sunk in shales which, from their softness, are locally called soapstone, and at a depth of 200 feet or more rest upon a limestone formation known as the Corniferous limestone, which underlies a considerable portion of Western Canada.

If the fissures in the oil-bearing rock along the anticlinals are open to the surface, the oil will flow out and be lost. If, on the contrary,

this rock be overlaid by higher formations of different texture, which have been exposed to the same strain along the anticlinal, irregular rents or fissures may occur in these, into which the oil will rise and accumulate, together with water and with gas, which follow the same law as the oil,—the fissures being often more or less completely closed above by plastic clayey strata, which do not permit the oil to filter through, but become reservoirs.

Another case may be that of overlying porous beds in which the oil finds a lodgment, and, from the nature of the surrounding strata, rests imprisoned. An instance of this was met with at Enniskillen, where, above the soft shales and beneath the surface clays, was a gravel-bed filled with oil, which had slowly come up from below, and been retained there perhaps for ages. This stratum was the source of the so-called surface wells, after exhausting which, borings were sunk into the shales below, and at various depths often penetrated the irregular fissures or veins, from which very large quantities of petroleum were obtained. We find over great areas of the oil-bearing limestone of Western Canada but insignificant quantities of petroleum; and the reason of this is that the strata are often nearly or quite horizontal, and have not the arrangement required for its accumulation, or the absence of overlying strata has allowed it to run to waste. Thus, at Tilsonburg, where wells have been sunk in the limestone itself, which is covered only by a few feet of clay, the amount of oil is small; while in Enniskillen, where the limestone is overlaid by more than 200 feet of fissured shales, which, in their turn, are covered by beds of gravel and clay, all helping to retain the oil, the wells sunk to various depths in the shales yielded in little over a year (1861–62) about 16,000,000 of litres of petroleum, and still continue to furnish it, though in less quantities. In Pennsylvania and Ohio the oil-bearing rocks, which are near the surface in Canada West, dip beneath the great masses of Devonian sandstone and shale already noticed. These have furnished reservoirs for the oil, and hence the wells along the anticlinals in those regions are still more productive than those of Canada.

It thus becomes very important in searching for petroleum in an oil-bearing region to determine the position of the anticlinal axes. These are not necessarily marked by any irregularities of the surface, for the folded strata were, ages since, partially worn away by the action of the elements; and as the surfaces thus planed, and often sculptured into hills and valleys, are now covered over by sands and clays, which, in Western Canada, give us but few opportunities of seeing the rocks beneath, it is only by actual inspection of these at

numerous points, and by the contours of the outcrops, that we can determine their attitude. It will be understood that the beds of rock, on the two sides, slope away in opposite directions at a greater or less angle.

In all the cases just described Andrews supposes that the oil is a slow subterranean distillation, and that such distillation is going on; this he infers from the immense quantity of gas thrown off from such bituminous shales, furnishing abundant sources for gas used in illumination and heating.

#### PROPERTIES OF NATURAL PETROLEUM.

I now pass to the consideration of the nature of petroleum. It is evident, from what has been already said in regard to the great range of differences in the physical and chemical nature of mineral oils, that while they possess a general common characteristic there are greater or less differences between them; the difference being as great or greater than that between the different forms of mineral coal. Hydrogen and carbon are the two elements that constitute nearly their entire mass; in many of them the greater part of these elements are already associated in such form that the simple application of heat will expel them, while other portions of the hydrogen and carbon are so combined that the application of heat only results in destructive distillation, as when mineral coal or bituminous schist is distilled.

Petroleums vary much in their physical characteristics, from a thick, viscous mass, as found on the island of Trinidad and elsewhere, to a liquid as mobile as ether and even to compound with boiling-points below zero. The former variety most commonly bears the name of mineral pitch or asphaltum, but it is difficult to tell where the pitch ends and the petroleum proper begins, as the grades between the two are so numerous and pass insensibly one into the other. They vary also in color from a pitchy black to a nearly colorless limpid liquid.

The differences of color and consistency in different specimens depend chiefly on the presence of pitchy substances dissolved in the oil.

The boiling-point of petroleum varies from  $82^{\circ}$  C. to  $316^{\circ}$  C., and never remains constant. The names given to the different compounds furnished by petroleum are, most of them, good scientific ones, well recognized by all; many, however, bear commercial names, and these are mixtures of several of the hydrocarbons, and I shall give

as full a statement of them as possible in detailing their composition. A statement of the specific gravity of petroleum will be found in different parts of this report. There is but little to distinguish these liquid hydrocarbons from each other, other than their specific gravity and boiling-point. All these hydrocarbons are remarkably indifferent to chemical reactions with other agents. They are attached by chlorine and bromine with a substitution of some of the hydrogen by chlorine and bromine, and when these ethereal compounds are decomposed by sodium, hydrocarbons are left with two atoms less of hydrogen, they having passed to the series of olefiant gas.

#### BOILING-POINT OF PETROLEUM AND ITS PRODUCTS.

The boiling-points of the various substances which constitute natural petroleum, as well as those hydrocarbons that may be formed during the distillation of petroleum, are of the greatest interest in studying this class of bodies. Most commonly it is the only means we have of classifying them. The most complete investigations we have on this subject, as connected with American petroleum, are those of C. M. Warren, and yet, as he has informed me, much remains to be done. Mr. Warren examined other hydrocarbons besides those pertaining to petroleum, as, for instance, those from coal-tar, naphtha, oil of cumin and cuminic acid, and the naphtha from lime-soap. The results of these investigations are more worthy of consideration from the fact that a most complete, although somewhat complicated, process was devised by which to arrive at very accurate results in the process of fractional distillation, which process is fully described in the *Proceedings of the American Academy of Boston*, May 10, 1864, page 121, in which he clearly sets forth the disadvantages of the previous processes and the advantages of his own.

In regard to value of a constant boiling-point in the petroleum compound as indicative of a uniform product, those who have paid much attention to the subject know that this evidence must be taken with a certain degree of precaution, for Warren and others have observed that a body may have a constant boiling-point and yet contain enough of a foreign substance to appreciably—and in delicate cases seriously—affect the determination of its constitution and of some of its other properties.

I might state that Warren's distilling apparatus is based upon the principle of the apparatus used in rectifying alcohol, and has been used in his laboratory for a number of years; and he says that, after this long experience, he has not yet found a mixture so complex



that it may not be resolved by this process into its proximate constituents so completely that these shall have almost absolutely constant boiling-points. In repeated instances, even from petroleum, he has obtained these constituents so pure that the contents of an ordinary tubulated retort charged with one of them has been completely distilled off without any essential change of temperature,—*i.e.*, not to the amount of  $\frac{1}{2}^{\circ}$  C.,—the thermometer frequently remaining absolutely constant for more than half an hour, a constancy of boiling-point not exceeded by that of distilled water.

After the liquids are separated and purified, the temperature is tested by putting the hydrocarbon in a small tubular retort, and a thermometer is introduced nearly to the bottom. To regulate the evolution, metallic sodium instead of platinum is introduced in the retort, which has the additional advantage of preserving the purity of the material and never loses its efficiency, which platinum does by becoming coated with a thin film. The retort is placed in a wire cage and heated with a small gas-flame, taking special precaution to prevent the thermometer being affected by any heated current of air; and for temperatures below the ordinary temperature, the retort is placed in a water-bath containing ice-water, and the temperature gradually raised by a gas-flame. But to learn all the precautions taken one must refer to the original memoir; suffice it to say that in his series of experiments the whole quantity operated upon would distill within the range of  $1^{\circ}$  temperature, and not unfrequently within  $0.5^{\circ}$ .

The following is the result of his experiments on three series of hydrocarbons from the Pennsylvania petroleum, compared with those from other sources:

## FIRST SERIES.

FORMULA.	BOILING-POINT.	ELEMENTARY DIFFERENCE.	DIFFERENCE OF BOILING-POINT FOUND.	RANGE OF TEMPERATURE WITHIN WHICH THE SUBSTANCE WOULD ALL DISTILL.
$C_4H_{10}$	0.0 (?)	.....	0	0
$C_5H_{12}$	30.2	$CH_2$	30.2	1.5
$C_6H_{14}$	61.3	$CH_2$	31.1	0.8
$C_7H_{16}$	90.4	$CH_2$	29.1	1.0
$C_8H_{18}$	119.5	$CH_2$	29.1	1.0
$C_9H_{20}$	150.8	$CH_2$	31.3	0.8
				$150.8 + 5 = 30.16^{\circ}$
Average increment of boiling-point for the addition of $CH_2 = 30.16^{\circ}$ .				

## SECOND SERIES.

FORMULA. (?)	BOILING-POINT.	ELEMENTARY DIFFERENCE.	DIFFERENCE OF BOILING-POINT FOUND.	RANGE OF TEMPERATURE WITHIN WHICH THE SUBSTANCE WOULD ALL DISTILL.
$C_4H_{10}$	8°	.....	°	°
$C_5H_{12}$	37.0	$CH_2$	29.0	0.4
$C_6H_{14}$	68.5	$CH_2$	31.5	0.6
$C_7H_{16}$	98.1	$CH_2$	29.6	1.2
$C_8H_{18}$	127.6	$CH_2$	29.5	1.5
$119.6 \div 4 = 29.9^\circ$				
Average increment of boiling-point for the addition of $CH_2 = 29.9^\circ$ .				

## THIRD SERIES. (Not completed.)

FORMULA.	BOILING-POINT.	ELEMENTARY DIFFERENCE.	DIFFERENCE OF BOILING-POINT FOUND.	RANGE OF TEMPERATURE WITHIN WHICH THE SUBSTANCE WOULD ALL DISTILL.
$C_{10}H_{20}$	174.9	.....	°	°
$C_{11}H_{22}$	195.8	$CH_2$	20.9	1.5
$C_{12}H_{24}$	216.2	$CH_2$	20.3	2.2
$41.2 \div 2 = 20.6^\circ$				
Average increment of boiling-point for the addition of $CH_2 = 20.6^\circ$ .				

Two series of hydrocarbons from Albert coal, one ranging from  $59^\circ$  to  $119^\circ$ , boiling-point, formula from  $C_5H_{12}$  to  $C_8H_{18}$ , gave  $29.9^\circ$  as average difference for  $CH_2$ ; the other series, with same range of formula and boiling-points, from  $68^\circ$  to  $125^\circ$ , gave  $28.6^\circ$  for  $CH_2$ . Benzole, toluole, xylene, and isocumole from coal-tars, ranging from  $80^\circ$  to  $169.9^\circ$  boiling-point, gave  $29.97^\circ$  difference for  $CH_2$ , and cumole and cymole gave  $28.5^\circ$  difference for  $C_7H_8$ . With only a single exception, the results presented in the above tables point clearly to  $30^\circ$  as the common increment for the addition of  $CH_2$  in homologous series of hydrocarbons. Indeed, leaving out of the calculation the third series from petroleum (having the general formula  $CH_2$ ), which must remain anomalous, and also the products from oil of cumin, the average of all the other boiling-point differences is  $29.75^\circ$ . Some of the slight discrepancies were traceable to errors in the thermometer or to smallness of amount of material used, as was the case of cymole and cumole.

It will be observed that Warren makes his boiling-point differences in the benzole series much more than Church did,—the latter experimenter making it  $22^{\circ}$ ,—and he also made out one more member of that series than Warren, who cannot find more than four; and the experiments of Warren were made with such care, and with Church's results before him, that I place great confidence in his results, establishing the common difference of  $30^{\circ}$  for the addition of  $\text{CH}_2$ , among the hydrocarbons from Albert coal and petroleum, excepting the third series from petroleum, with the difference of  $20^{\circ}$ .

This difference of  $30^{\circ}$ , thus shown to be so common with the hydrocarbons, is so much larger than the difference of  $19^{\circ}$ , which Kopp had found so frequent in other classes of substances, that the discrepancy cannot be regarded otherwise than as conclusive evidence, if such were wanting, that all liquid bodies do not obey the same law in this regard, but that there are unquestionably those series in which the boiling-point difference for the elementary difference of  $\text{CH}_2$  may be greater than  $19^{\circ}$ , of which Kopp has already furnished some examples. And this difference may be even less than  $19^{\circ}$ , confirmed by the nitro-benzole series, this being  $13.6^{\circ}$ ; and in the aniline series, as toluidine, xyloidine, and isocumidine, where we have  $17^{\circ}$  difference.

As this question of the boiling-point of hydrocarbons is of the highest scientific importance, and must ultimately make itself felt in the industrial application of these substances, I will give a table of the actual differences found in the boiling-points of the Pennsylvania petroleum contrasted with the boiling-point as calculated by the theories of different authors.

According to *Schröder's theory*, each atom of carbon (C) is supposed to influence the boiling-point  $30^{\circ}$ , and each atom of hydrogen (H) to influence the same  $10^{\circ}$ ; from the sum of these influences the number  $70^{\circ}$  is in all cases to be deducted, in order to find the boiling-point. The boiling-points of the three series of Pennsylvania hydrocarbons already referred to would range, first series from  $0^{\circ}$  to  $100^{\circ}$ ; second series  $0^{\circ}$  to  $80^{\circ}$ ; third series  $130^{\circ}$  to  $170^{\circ}$ .

According to *Löwig's theory*, one atom of carbon (C) raises the boiling-point  $38.4^{\circ}$ , and one atom of hydrogen (H) lowers it  $29.2^{\circ}$ , which would make, first series  $15.2^{\circ}$  to  $107.2^{\circ}$ ; second series  $15.2^{\circ}$  to  $86.8^{\circ}$ ; third series  $184^{\circ}$  to  $222.8^{\circ}$ .

According to *Gerhardt's theory*, it would be, first series  $8^{\circ}$  to  $94.5^{\circ}$ ; second series  $8^{\circ}$  to  $74^{\circ}$ ; third series  $130^{\circ}$  to  $171^{\circ}$ ; which proves that all these theories are merely artificial, not according with observation,—the actual observation being, first series  $0^{\circ}$  to  $150.8^{\circ}$ ; second series  $8^{\circ}$  to  $127.6^{\circ}$ ; third series  $174.9^{\circ}$  to  $216^{\circ}$ .

Summing up the careful experiments above referred to, the following conclusions have been arrived at by Warren :

1st. That the boiling-point differences for the addition of  $\text{CH}_2$  in homologous series of hydrocarbons is generally  $30^\circ \text{C}$ ., which is a much larger difference than has been commonly supposed.

2d. That of the five series of hydrocarbons examined, only one series was found exceptional to the rule just stated, and this presented the boiling-point difference of about  $20^\circ$ , which is but little larger than the number  $19^\circ$ , which Kopp found so common with other classes of substances.

3d. That certain series of derivatives from the benzole series of hydrocarbons present boiling-point differences, corresponding to the elementary difference of  $\text{CH}_2$ , considerably smaller than the number  $19^\circ$  of Kopp.

4th. That the formulæ of Schröder, Löwig, and Gerhardt for the calculation of boiling-points, so far as those may be supposed to relate to the hydrocarbons, are incorrect, and purely artificial.

5th. That the custom of taking boiling-points with the bulb of the thermometer in the vapor is more liable to lead to an erroneous determination, at least in certain cases, than if the bulb be placed in the liquid.

As a proper addition to this part of the subject, I will add a tabulated statement of the careful experiments of St. Claire Deville, with the addition of co-efficient of dilation of the different petroleums, an important element to be considered in the commercial transportation of this article :

LOCALITIES OF PETROLEUMS.	COMPOSITION.			DENSITY.		COEFFICIENT OF DILATION.	PORTIONS DRIVEN OFF BY HEAT AT DIFFERENT TEMPERATURES IN 100 PARTS.																			
	C.	H.	O.	At 60°.	At 50°.		100°	120°	130°	140°	150°	160°	170°	180°	190°	200°	210°	220°	230°	240°	250°	270°	280°	292°	300°	
1	85.6*	9.6	4.5	0.968	0.935	0.000697																				
2	85.7	12.0	2.3	0.892	0.857	0.000793																				
3	86.2	13.3	0.5	0.861	0.828	0.000558																				
4		13.6	6.9	0.839	0.795	0.000843																				
5	79.5	13.2	1.2	0.894	0.731	0.000637																				
6	86.1	12.7	6.9	0.892	0.860	0.000772																				
7	86.2	11.4	2.4	0.955	0.935	0.000641																				
8		84.4	11.5	4.1	0.944	0.915	0.000662																			
9		82.2	12.1	5.7	0.870	0.836	0.000813																			
10		85.3	12.4	2.1	0.885	0.852	0.000775																			
11		85.3	11.5	3.1	0.9405†	0.904	0.000696																			
12		84.2	12.4	3.4	0.887	0.850	0.000750																			
13		82.6	12.5	4.9	0.862	0.828	0.000748																			
14		83.0	12.2	4.8	0.901	0.868	0.000716																			
15		84.9	11.4	3.7	0.918	0.905	0.000732																			
16		81.9	12.5	5.6	0.809	0.770	0.000963																			
17		86.4	12.2	1.4	0.919	0.884	0.000752																			
18		82.6	11.8	5.6	0.952	0.921	0.000673																			
19		83.0	14.6	2.4	0.828	0.801	0.000883																			
20		84.3	13.4	2.3	0.857	0.838	0.000668																			
21		84.5	13.5	2.0	0.870	0.851	0.000836																			
22		82.7	13.5	3.8	0.844	0.815	0.001000																			
23		83.2	13.2	3.6	0.857	0.824	0.000788																			
24		81.6	12.9	3.5	0.897	0.866	0.000704																			
25		83.8	12.7	3.5	0.875	0.845	0.000774																			
26		83.5	12.9	3.6	0.860	0.822	0.000824																			

\* The Béchbranner oil contained also 0.25 per cent. of nitrogen and 10.95 of solid residue.

† The density of the Circassian petroleum was taken at 20° C.

The same petroleum purified :

No.	COMPOSITION.			DENSITY AT 20° TO 22° C.	DENSITY OF RESIDUE OF DISTILLATION AT 20° C.	No.	COMPOSITION.			DENSITY AT 20° TO 22° C.	DENSITY OF RESIDUE OF DISTILLATION AT 20° C.
	C.	H.	O.				C.	H.	O.		
2	84.5	12.6	2.9	0.816	0.914	15	83.8	12.6	3.6	0.830	0.944
3	84.3	13.6	2.1	0.776	0.882	16	83.0	13.1	3.9	0.783	0.874
4	85.5	14.2	0.3	0.776	0.840	17	84.7	12.1	3.0	0.880	0.936
5	86.5	12.4	1.1	0.865	0.888	18	82.7	12.8	4.5	0.883	0.942
6	82.3	13.6	3.2	0.775	0.908	19	83.3	16.1	0.6	0.776	0.846
7	84.3	12.5	3.2	0.842	0.959	20	83.3	14.2	0.5	0.773	0.879
8	84.1	13.0	2.9	0.830	0.944	21	79.4	14.1	6.5	0.781	0.866
9	83.5	13.6	5.9	0.778	0.901	22	85.2	14.1	0.7	0.782	0.864
10	83.8	12.9	3.3	0.786	0.931	23	81.9	13.8	4.3	0.781	0.874
11	83.1	12.8	4.1	0.857	0.944	24	81.0	12.3	3.7	0.855	0.893
12	83.5	13.5	3.0	0.787	0.936	25	83.9	13.9	5.2	0.795*	0.890†
13	80.1	13.7	6.2	0.778	0.910	26	83.8	12.9	3.3	0.884†	0.881‡
14	83.5	13.2	3.3	0.804	0.924						

\* At 23° C.

† At 28° C.

‡ At 26° C.

§ At 35° C.

## COMPOSITION OF PETROLEUM.

This part of the history of petroleum is but imperfectly worked out. Pelouze and Cahours, Warren de la Rue, C. M. Warren, and others, have established one or more series of hydrocarbons, homologous to marsh-gas, which, in fact, form the bulk of the different varieties of petroleum; but, beside these, they contain oxygen compounds not yet studied or separated, and some of them contain also sulphur compounds of which we as yet know nothing. The following is a tabular statement of the hydrocarbons as made out by Pelouze and Cahours :

FORMULA.	SPECIFIC GRAVITY.	BOILING-POINT.	VAPOR DENSITY.	AUTHORITY.
$C_2H_6$	Gas forming.	.....	.....	Ronalds.
$C_3H_8$	"	.....	.....	
$C_4H_{10}$	0.600 below 0°	0° 4°	2.110	
$C_5H_{12}$	0.628 " 17°	30°	2.538	
$C_6H_{14}$	0.669 " 16°	68°	3.050	
$C_7H_{16}$	0.699 " 15°	92° 94°	3.616	Pelouze and Cahours.
$C_8H_{18}$	0.726 " 15°	116° 118°	4.009	
$C_9H_{20}$	0.741 " 15°	136° 138°	4.541*	
$C_{10}H_{22}$	0.757 " 15°	160° 162°	5.040	
$C_{11}H_{24}$	0.766 " 16°	180° 184°	5.458	
$C_{12}H_{26}$	0.776 " 20°	196° 200°	5.972	
$C_{13}H_{28}$	0.792 " 20°	216° 218°	6.569	
$C_{14}H_{30}$	.....	236° 240°	7.019	
* $C_{15}H_{32}$	.....	255° 260°	7.523	

\* Paraffine of the formula  $C_n H_{2n+2}$ .

C. M. Warren, in his researches, mentions two other series upon which his labors are not yet completed. One of these is a series homologous to marsh-gas, but with boiling-points different from the

above series. The author, however, says he is somewhat in doubt whether this series has the formula  $C_nH_{n+2}$ . The other series he refers to as homologous with olefiant gas, and the three individuals of the series he has examined are as follows (*Proceedings Am. Acad.*, Oct. 1864):  $C_{10}H_{20}$ ;  $C_{11}H_{22}$ ;  $C_{12}H_{24}$ . Also *paraffine*, the exact position of which we will refer to in another place. Also thalene and petro-lucene, which will be described.

#### THE GASEOUS HYDROCARBONS IN PETROLEUM.

By these are meant those hydrocarbons which are present in and obtained by warming gently the petroleum, but when separated do not condense into a liquid above  $0^\circ$  C. So far as yet made out they are the following:

Marsh-gas . . . .	$CH_4$ .		Butylic hydride . . . .	$C_4H_{10}$ .
Ethylic hydride . . . .	$C_2H_6$ .		Amylic " . . . .	$C_5H_{12}$ .
Propylic " . . . .	$C_3H_8$ .			

The butylic hydride condenses into a liquid at about  $0^\circ$ , and is the lightest known liquid, being 0.600, with a vapor density of 2.11; it is not affected by nitric acid or bromine; with the aid of light, it combines with chlorine and forms chloride butyl.

These hydrides are held in solution in the petroleum, as water may dissolve gaseous substances.

When these hydrides are condensed and then evaporated rapidly, they can freeze mercury.

In commerce there are various very volatile liquids obtained from petroleum, some of them boiling below  $16^\circ$  C., but as they are furnished in commerce they are mixtures, and bear the names of rhigolene, gasoline, chymogene, etc.

#### SOLID HYDROCARBONS IN PETROLEUM.

These hydrocarbons have been supposed to be products formed during the action of heat on petroleum, but there is no doubt that paraffine, at least, exists ready-formed in petroleum, while it is equally reasonable to conclude that more or less of it is formed during the process of distillation. In some of the processes of distillation of petroleum a thick gelatinous hydrocarbon mixture is obtained, apparently bordering on paraffine, but from which this substance will not crystallize. Now, if this thick mass be distilled, paraffine will then crystallize readily from the product of distillation. It is said that there is no paraffine in the heavy oils of California.

## PARAFFINE.

This substance is so well known and has been so thoroughly described that I will only make a short summary of its properties. As known in the arts, it is not a simple hydrocarbon, but is undoubtedly composed of a series of this class of compound, all of them being hydrides of the alcohol radical, which fact is rendered very probable by a view of the following table:

Paraffine from	Melting-Point.	Paraffine from	Melting-Point.
Boghead (coal)	45.5° C.	Peat	46.7°
" "	52°	Japanese wax	57° to 58°
Rangoon (pitch)	61°	Beeswax	62°

It has usually been regarded as a mixture of olefians, but  $C_nH_n$  requires 85.71 C., whereas paraffine, regarded as hydrides of the alcohol radicals, gives—

Paraffine from Chinese wax	$C_{54}H_{56}$ —85.2 C.
" " beeswax	$C_{60}H_{62}$ —85.3 C.

The manner of procuring paraffine on a large scale from petroleum, with its applications, will be fully detailed under the head of *petroleum industry*.

## THALLENE.

This is another one of the solid hydrocarbons from petroleum, and we are indebted to Professor Henry Morton for its discovery and separation in a pure state. His attention was drawn to a rosin-colored tarry fluid among the last products of the distillation of petroleum. When the residues left in the distillation of petroleum for the manufacture of illuminating oils are redistilled to obtain lubricating oils and paraffine, there passes over near the end of the operation, and when the still is at the bottom almost or even quite red-hot, a thick resinous matter of a dark honey or light sepia color, which is used as a lubricant for the necks of "rolls" in iron-mills. This is the material from which the new body is extracted by the following process.

The tarry matter above described is mixed with about its own volume of benzine (light petroleum naphtha), and is thrown on a stout filter, where it is well washed with the same solvent. This leaves a dark, olive-green, flaky powder, constituting about 3 per cent. of the original mass, and very similar in appearance to crude commercial anthracene. This is now washed with alcohol, and even digested in this liquid, by which means a brown material, whose solution in alcohol has a decided fluorescence, is removed. The substance is then dissolved in hot benzole (coal-tar product) and filtered in a jacketed



funnel, by which operation a quantity of black powder is removed, and allowed to crystallize on cooling. It then deposits in very small acicular crystals, collecting in tufts, and the purification is carried on by re-solution and crystallization from fresh benzole. The substance thus obtained has the color of potassium chromate. The following table of solubilities will indicate the motive for the above treatment :

Benzine, hot (71° C.),	dissolves 1 part in	.	.	.	.	.	1,155
" cold (21° C.),	"	"	.	.	.	.	2,900
Alcohol, hot (71° C.),	"	"	.	.	.	.	4,172
" cold (21° C.),	"	"	.	.	.	.	16,725
Benzole, hot (70° C.),	"	"	.	.	.	.	152
" cold (21° C.),	"	"	.	.	.	.	95

This substance dissolves in turpentine pretty freely, and yet more so in carbon bisulphide and chloroform. In ether and olive oil, and carbon bichloride, it is hardly as soluble as in benzine. This substance is doubtless a product of decomposition, and does not exist originally in the petroleum, but of this we have no positive evidence. Four ultimate analyses show the composition of the purified body to be :

	First.	Second.	Third.	Fourth.
Carbon . . . .	93.02	93.06	93.84	93.44
Hydrogen . . . .	5.63	5.70	6.09	6.17

That of anthracene is, hydrogen, 5.61 ; carbon, 94.39 ; which would give it about the same percentage composition as anthracene. A pretty extended study of its physical and chemical properties, however, shows that it is quite a different substance.

While anthracene combines with about twice its weight of picric acid to form the picrate, which crystallizes in long needles of a rich strawberry color, thallene requires fully four times its weight of picric acid to saturate it. On cooling from hot solution, a granular mass of minute crystals is formed having a rich orange-red color. Examined under the microscope, these crystals are seen to be short prisms with well-defined pyramidal terminations.

Sulphuric acid of density 60° B., which rapidly blackens anthracene even at the ordinary temperature, gives thallene a rich, grass-green color, which remains unchanged even after standing for weeks and exposure to a temperature of 60° C.

The picric acid, compounds both of anthracene and thallene, show no fluorescence, so that this gives us a convenient method of determining the point of saturation.

A little solid thallene placed between slips of mica in Becqueret's phosphoroscope, showed a bright illumination, with a rate of rotation

corresponding to a duration of about  $\frac{1}{10}$  of a second for the fluorescent action, but the benzole solution showed no illumination at the highest velocity to which the apparatus could be urged.

By the exposure of a hot benzole solution of thallene to intense sunlight, which is best done by bringing it near the focus of a large lens and allowing it to cool, in a very short time its character is changed, and now almost white crystals are deposited, differing from thallene in its fluorescent property, and exhibiting different absorption bands; also the amount of picric acid required to saturate is different. Professor Morton has called this substance *Petrolucene*.

#### DEVELOPMENT OF THE PETROLEUM-INDUSTRY.

As late as 1850 the only use to which petroleum was put was of a medicinal nature, being used as an external application for certain diseases under the name of Seneca oil. Its great use as an illuminating and heating agent had not yet entered the mind of any one. It has been well said by J. T. Henry (to whom we owe a very interesting work on petroleum) that the world was not ready for it, and that it is mainly to chemistry that we owe those elaborate experimental researches which demonstrated the practical use of petroleum to the domestic comforts of refined civilization.

It is to Reichenbach's discovery of paraffine that we owe the birth and growth of the petroleum-industry.

The valuable property of this substance, first discovered in such small quantity, and its capacity of substituting wax for many of its uses, led experimenters to search for some abundant source of it. Selligne, in France, became engaged in the distillation of hydrocarbons from shale, expecting to use them as an illuminating agent, at the same time attempting to extract paraffine from them; but it was not until James Young, of Scotland, discovered a method of making it on a large scale that the existence of paraffine was demonstrated to be of incalculable benefit to the civilized world, and in 1850 he procured a patent for manufacturing "paraffine oil, or oil containing paraffine, and paraffine from bituminous coal."

It will be seen that in this process of Young's both a liquid and a solid carbon were formed by distilling coal at a low red-heat; the solid portion or paraffine could be readily used for making candles and substituting sperm and wax, and the heavier part of the liquid was used to lubricate heavy machinery; but the great bulk of the oil could not yet be used for any valuable purpose. It was evident that it was a cheap and good illuminating agent, but how to burn it without incon-

venience and with comparative safety had not yet been discovered. To do this, it remained to discover a lamp adapted to its use; the ingenuity of inventors soon overcame this difficulty, and a new light, as it were, broke upon the world, and everywhere factories were established to make illuminating oil from coal, and for many years coal oil was used to the exclusion of most forms of fatty oils, and the inventor, James Young, reaped a colossal fortune, for it was not until ten years after his engaging in the manufacture of coal oil that petroleum attracted the attention of the world; and it was about 1860 that petroleum-industry fairly began to be developed, and first in Pennsylvania. In fact, about this time commenced that oil-fever which spread with more rapidity and ran higher than the gold-fever of California or Australia, some ten and twenty years before.

Oil was now sought for by boring artesian wells in those regions of country where there were surface indications of oil, and in many instances with such wonderful results that it is not surprising so much excitement should have been produced; poor men were made millionaires in a day; the simple peasant would go to bed on his hard couch and in the morning wake to learn that he had the wealth of a prince; in fact, were all the tales told of the early days of the oil region of Pennsylvania, they might well serve to supplement the thousand and one Arabian nights.

I will just enumerate the yield of a few of the wells bored at that time:

In 1861 the Fountain well was finished, and gave a constant flow of 300 barrels\* per day, and flowed in this manner for fifteen months. The Phillips well burst forth with a flow of 3000 barrels daily, and hardly had this been finished when another well near by, the Empire well, suddenly burst forth with its 3000 barrels per day. The Noble & Delamater well flowed first at the rate of 3000 barrels per day, commencing in 1863, and continued to flow until 1865, and is estimated to have furnished \$3,000,000 worth of oil. At this time a single acre of land, with what was then considered a medium yielding well, has sold for \$150,000, and thus continued the development of petroleum, accompanied by a spirit of speculation transcending the most exciting gold speculations of California and Australia.

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\* Barrel equal to about 160 litres.

## PRODUCTION OF PETROLEUM.

With this wonderful and abundant source of petroleum, what is the annual yield of this mineral product per annum? The following are the official statements for the year ending 1872:

Pennsylvania oil regions . . . . .	1,046,240,000 litres.
West Virginia, Ohio, and Kentucky . . . . .	52,000,000 "
Canada . . . . .	84,800,000 "
Total for 1872 . . . . .	<u>1,183,040,000 litres.</u>

This yield has been gradually increasing, as may be seen by the following statement: In America, in 1872, the daily average product was 20,271 barrels (each barrel = 160 litres); in 1871, 18,100 barrels; and in 1870, 17,900 barrels. Canada has yielded a larger product than it now does and has done during the past two years; the average value has been three cents per litre, making the entire product of 1872 worth over \$38,000,000.

The amount produced and on hand in 1875 exceeds this, as may be seen by the following statement, given me by Mr. F. S. Pease, of Buffalo:

Amount of crude oil on hand January 1, 1875 . . . . .	4,104,703 barrels.
Amount produced in 1875 . . . . .	8,787,506 "
Total . . . . .	<u>12,892,209 barrels.</u>

The total consumption of crude petroleum by the world in 1872 was 6,664,000 barrels, being an increase of nearly 11 per cent. over the year previous; and if we add to this the oils produced from shale and coal, the consumption by the world at the present time of these hydrocarbons cannot fall much short of 400,000,000 gallons.

The crude oil as it comes from the wells is not employed in the arts, except that variety of heavy oil called lubricating oil, which can be used in its crude state for machinery, and for that reason is more highly esteemed by those engaged in this industry, as it commands a higher price in the market.

It is, however, only after undergoing fractional distillation and treatment by certain chemical products that petroleum becomes fitted for the various uses in arts, and, as it might be supposed, this industry is most largely carried on in America. In the oil region of Pennsylvania over 1,500,000 litres of refined oil are turned out daily; in the city of New York nearly 2,000,000 of litres; and there is one refining establishment in Cleveland, Ohio, said to turn out over 1,800,000

litres daily, and there are numerous other refineries in the Western and Eastern States.

#### THE CHEMICAL INDUSTRY OF PETROLEUM.

The crude petroleum, as it comes from the wells, is subjected to distillation, when the most volatile constituents pass off first, in the form of vapor, and are condensed by passing through a coil of iron pipe surrounded by cold water, and collected as benzine or naphtha. Subsequently the burning-oil or kerosene makes its appearance. This is followed by a heavier oil, which contains paraffine, and may be used for lubricating machinery; and there is finally a small residue of tar or coke left in the still.

That portion of the product which is designed for illuminating oil is then subjected to the action of sulphuric acid to remove the odor and color, and to destroy a little tar which it still contains. A tarry, acid sediment forms, which is removed. The clear oil is then treated with alkali, to neutralize the last traces of acid. It is then subjected, by the more careful refiners, to a somewhat elevated temperature, to expel a small percentage of benzine which it still contains. Thus purified, it constitutes the kerosene oil as it is sold in the market.

The largest establishments for this purpose are to be found in America, and it shall be our endeavor to give as complete and practical a detail as the limits of this paper will allow, selecting one of the best-directed petroleum-works from which to make the necessary details. The works in question are those of Samuel Downer, of Boston, who has been engaged in distilling hydrocarbons since 1866, under the direction of a most competent and skilled manager, Mr. Merrill; and I must here acknowledge my obligations to Messrs. S. Dana Hayes and Benjamin Silliman for the aid they have furnished me in getting detailed information; especially to the latter gentleman are we indebted, and there is no chemist in the country who has studied this part of the subject so extensively and thoroughly. To him we are also indebted for original ideas on certain of the phenomena that take place during the distillation, and which will be mentioned more fully under the head of "cracking."

It was not until about 1859 and 1860 that petroleum was distilled for use, at which time there were about fifteen establishments using petroleum exclusively. Since this time the number of factories has increased very largely, and some of them are of gigantic dimensions, having immense wrought stills, each capable of holding 80,000 gallons or 400,000 litres. The principles connected with the purification

of the crude article are very nearly the same in all the establishments, but there is no one more extended and perfect in its arrangements than that of the Downer Kerosene Oil Company, of Boston, the operations of which establishment I have been able to condense into a tabular form with the aid of Professor Silliman. The principles of purification are, first, to distill the crude article by fractional distillation; to treat the same with sulphuric acid; and, lastly, to wash the oil with caustic soda. Before referring to special products connected with this industry, I will give a tabular view of the different operations.

GENERAL SCHEME OF THE TREATMENT OF CRUDE PETROLEUM OF PENNSYLVANIA. PRACTICE OF THE DOWNER KEROSENE OIL COMPANY, BOSTON AND CORRY, PA.

(The temperatures are given in these tables according to the Fahrenheit scale.)

TABLE I.

*Average density of the crude oil = 45° Baumé. 300 barrels, = 12,000 to 13,000 gallons, crude oil, are treated with "live steam" (i.e., at 212°) by a coil in a very large cylindrical still, producing of finished "gasoline" and naphtha, "C," "B," and "A," 15 per cent. of the crude oil operated on, as follows, viz.:*

1. Crude gasoline to 80° — 1-2 per cent. No acid is used in treatment of this, which is redistilled by dry heat, yielding 90° — 83° B. gasoline, used for gas carburetters, @ 30 cents per gallon. 83°-80° goes to crude gasoline for redistillation.	Crude "C" naphtha, down to 70° B., is treated with 4 ounces of oil of vitriol to the gallon, and washed with caustic soda, all cold-redistilled by steam from alkali solution.	Heavy naphtha, down to 60° B. is treated, as in "C," by acid and alkali, and redistilled from soda, and is, down to 68°, — "C" naphtha, finished; from 68°-64° — "B" naphtha, finished; and from 64°-60° — "A" naphtha, finished. Below 60° the product goes to crude oil. The "B" naphtha is used chiefly in the United States for coach-varnishes, painting, etc.; but little is exported. The "A" naphtha is used for making "floor oil-cloths" and patent leather; its value is the same as illuminating oil. This is a specialty of the Downer Company, and its standard — 62° B.	Remains in the still, crude burning-oil (see Table II.)
2. "C" naphtha includes the product from 80°-68° B.	The "C" naphtha ranges from 80°-68° B.; average, 70°. Used for varnishes, "sponge-lamps," painting, etc. Chiefly exported to Europe. Value in the United States, 20 cts.; for export, 14 cents. This is known in trade as "benzine-naphtha."		
3. "B" naphtha includes the products 68°-64° B.			
4. "A" naphtha is from 64°-60° B.			
These several products are treated as follows (see next column).			

SUMMARY OF TABLE I.—Oil 45° B. gives 12-15 per cent. of finished "gasoline" and naphtha, viz.:

1-2 per cent. of gasoline . . . = 90°-83° B.	2-2½ per cent. of "A" naphtha = 62° B.
10 " " "C" naphtha = 70° "	12-15 per cent. of total light product, net.
2-2½ " " "B" " = 65°-60° "	

TABLE II.

*Treatment of "crude burning oil." Remaining 88 to 85 per cent. from Table I. Below 60° B. The crude product from (I.) below 60° B. is distilled in cylindrical cast-iron stills with meniscus-shaped wrought-iron bottoms, by fire, with a per cent. of soda solution of 14° B. The product obtained divides as follows, viz.:*

No. 1 oil—50 per cent. from 58°–40° B.—yields the crude burning oil. This is treated by 4 ounces per gallon of 75 per cent. oil of vitriol by violent agitation for half an hour; this is then drawn off from the tarry substance, washed with water, and again agitated with 2 per cent. of alkali for one hour; drawn off from the alkali, and next day washed in a large amount of water, and pumped into the fire-still upon a solution of 4 per cent. of soda of 14° B.; then distilled as long as the color is good—about 80 per cent. Downer's standard kerosene, 45° B., and 125° Fah. fire-test.

Remaining 20 per cent. run to the crude burning-oil down to 36° B., the color being too poor for standard.

Below 36° B. goes to "finished machinery oil" for chilling and paraffine.

"Coakings" or residues kept back for separate treatment.

No. 2. "B" oil—20 per cent.—is treated like No. 1 in the fire-still on soda ley.

Above 36° B. goes to crude No. 1 burning oil; below 36° goes to the machinery oil, to be chilled and prepared for the removal of paraffine.

Below 36°—25 per cent.—goes to crude lubricating oil, and is treated with 4 ounces of acid to the gallon upon water at 212° Fah. for one hour, and is then distilled from a 2 per cent. solution of soda ley. Of the product thus obtained, above 40° B. goes to crude No. 1 burning oil; from 40° to 36° to crude No. 2 burning-oil; from 36° downwards, as long as the color is good, goes to machinery oil, to be chilled and pressed for removal of paraffine. Coakings—3 per cent.—go to coakings-tank. Loss 3 per cent.

## SUMMARY OF THE WORKINGS OF TABLE II.

No. 1 oil—45° B.	50 per cent.
No. 2 "	20 "
Lubricating oil	25 "
Coakings	3 "
Loss	2 "
	<hr/> 100 "

TABLE III.

*Machinery Oil = 36° B., and downwards.*

Twice distilled and chilled in barrels packed in an ice-house for a week with ice and salt at 26° Fah. = "Crude scale paraffine." (See Table IV.)

The crystalline magma pressed in canvas bags = "Pressed lubricating oil," which is partly sold as "Spindle oil" of 32° B., for fifty cents per gallon in bulk. To obtain "Merrill's deodorized heavy hydrocarbon oil," this crude oil, from the pressed crude paraffine, is placed in a fire-still provided with Merrill's tight and open steam-coils, the fire is lighted, and when the oil has a temperature of 250°–300° Fah., steam is passed through the tight coil, and when the superheated steam has the proper temperature it is permitted to flow from the perforated coil under the oil; 20–30 per cent. of lighter products, with all the empyreumatic and offensive bodies, ranging from 50°–32° B., are wafted over with the condensed water. Of this product, that between 50°–40° B. goes to "Crude machine oil," that between 40°–32° B. goes to "Mineral sperm." The oil left in the still by this

treatment = "Merrill's unbleached heavy hydrocarbon oil" of 29° B. This is used to dress leather and wool, and for adulterating fat oils, olive oils, etc.

To remove fluorescence, chromic acid is used in place of oil of vitriol.

TABLE IV.

*"Crude Scale Paraffine."*

Pressed = 25 per cent. "lubricating oil" of 32° B. *The pressed scale* =  $\frac{3}{4}$  pound per gallon of the crude 32 per cent. lubricating oil from the chilled mass in Table III.

To refine this, this scale is melted in an open tank by live steam blown in, with 1 per cent. of caustic soda ley; is drawn carefully off from the soda ley; then add 25 per cent. of "C" naphtha; mix well, and put aside for three or four days in shallow metallic pans to crystallize in a cold place. It is then cut, bagged, and pressed in the hydraulic press.

*"Paraffine No. 1 Stock."* This is again remelted with "C" naphtha on alkaline ley, recrystallized, and pressed three successive times, yielding large crystals of paraffine, melting at 130° Fah. The oils expressed go to crude "C" naphtha.

*"Paraffine No. 2 Stock"* is treated in the same way, furnishing a product of less value in smaller crystals, melting at about 116° Fah., and is sold as "chewing-gum," of which a single dealer in Bangor sold 75,000 pounds in one year for this singular use.

TABLE V.

*Coakings.* Average sp. gr. = 28° B.

Redistilled over a 2 per cent. alkali solution, the yield is as follows, viz.:

80 per cent. above 40° B. goes to No. 1. Crude burning-oil (II.)	15 per cent. 40°-36° goes to No. 2. Crude burning-oil (II.)	50 per cent. 36°, and as long as color is good, goes to crude lubricating (III.)	10 per cent. coakings to coakings-tank. 5 per cent. loss
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TABLE VI.

*"Sludge"* (residues from washings).

The alkali sludge is used to wash the "sludge" oil, and is then run off as waste.

The waste "acid sludge," 48°-50° B., is permitted to stand two days, and the oil rising from it ("acid sludge oil") drawn off, and the foul acid sold for \$1 for 12 gallons, or 36 litres, to the superphosphate-factories.

The sludge oil is then washed with waste alkali and redistilled separately without fractions, yielding oil 80 per cent., and coke and loss 20 per cent. This coke is used as fuel, and the oil is redistilled on alkali, and fractioned as crude oil below 60° B.

TABLE VII.

*Downer's Mineral Sperme: Illuminating Oil.*

This is the trade-mark of a dense oil of 36° B., deprived of empyreumatic odor, and adapted especially for light-house and locomotive lights.

To produce it any crude oil distillate of 40°-32° B. is first treated with 4 ounces of acid to the gallon, washed in alkaline water, and distilled in the fire-still on soda ley. It has a fire-test of 300° Fah., and but little odor. Its range of density is 40°-34°, average 36°. Below 34° downwards goes to "machinery oil," to chill and press, for removal of paraffine.



TABLE VIII.

Average composition of crude Pennsylvania petroleum of 45° B.:

	Per ct.	Per ct.	
Gasoline . . . . .	1	1½	} = 26½ Naphthas.
"C" naphtha . . . . .	10	10	
"B" naphtha . . . . .	2	2½	
"A" naphtha . . . . .	2	2½	
Standard illuminating oil . . . . .	50	54	
Finished lubricating oil . . . . .	...	17½	
Paraffine = 4½ pounds for barrel . . . . .	...	2	
Loss . . . . .	...	10	
		100	

With many manufacturers a portion—about one-half—of the naphthas is returned to the illuminating oil, increasing its proportion to 60 or 65 per cent., with a proportionate loss of safety.

## RHIGOLENE.

This is made by distilling gasoline (which is the very lightest petroleum—naphtha) by steam heat, and condensing the first distillate by the aid of ice and salt. In this way 10 per cent. of the gasoline is converted into the lightest of all known liquids,—sp. grav. .625, and boiling-point 60° Fah. The evaporation of this liquid is so rapid at common temperature that it will depress the thermometer to 19° below 0° Fah. It is used for surgical purposes to produce local anæsthesia.

## MERRILL'S HEAVY NEUTRAL (DEODORIZED) HYDROCARBON OIL.

As this oil is now used largely in the arts, it is well to say a word about it.

The process of making it consists essentially in treating the heavy distilled oils of a density lower than 45° B. at a well-regulated heat, preferably with a current of superheated steam, to vaporize from it the lighter bodies, leaving behind in the still about four-fifths of the original quantity, practically odorless; and, after removal of the paraffine and the usual treatment by acid and alkali, it is fit for all the purposes to which the best lubricators and heavy neutral oils are adapted. It is supposed that the odors in the heavy oils arise from matters resulting from decomposition at the temperature at which the heavy oils vaporize and go over, and that these matters, after they are condensed with the heavy oils, will vaporize at a temperature lower than that required to vaporize and distill over the heavy oils, and therefore may be separated from the heavy oils by being heated in a close still at a temperature below that required to distill the heavy oil,



the same agent. The Downer oil is always distilled in the last run from a soda ley of 20° Baumé, and about 3 per cent. of the volume of the oil to be distilled.

This last alkaline treatment is not practiced by American distillers generally, as it adds somewhat to the cost of manufacture, and detracts somewhat from the colorlessness of the distillate. But it has the important advantage of removing the last traces of the sulphuric acid used in the earlier stages of manufacture, and thus prevents the coating of the wick, which is a serious evil in the use of burning-oil retaining a trace of acid. The Pennsylvania oils are so free from sulphur compounds that no other care is required to fit them for use than the treatment with alkali. The Canadian oils, however, are highly sulphuretted, and the sulphur from them goes forward into all the products of distillation. Litharge has been used with success to absorb the sulphur, but its use is by no means common; also a plum-bate of soda. Nitric acid, with a little chloride of lime, has been used. Superheated steam has been used with good effect. But it is well established that almost any of the above processes will answer.

#### COST OF A PETROLEUM-REFINERY.\*

It may be interesting to practical chemists to know what is the cost of a refinery to operate a given quantity of oil, so I will give the apparatus and cost of one capable of working 900 barrels (36,000 litres) crude oil per week. The cost given is based on prices in America, and would be \$40,000 to \$50,000 (200,000 to 250,000 francs), consisting of 3 stills for crude oil, each running two charges of 24,000 litres per week.

1 naphtha still.

Tanks—1 crude oil tank, 960,000 litres; 3 crude burning-oil tanks, holding each one charge; 2 refined burning-oil tanks, 640,000 litres; 1 crude naphtha tank, 32,000 litres; 1 refined naphtha tank, 160,000 litres.

Agitator, 1 running one charge per day, with air-pumps.

Steam-boiler for pumps and engines.

Steam-engine, 12 to 15 horse-power, for air-pumps, etc.

Pumps—5 to 6 steam-pumps.

Such an establishment is considered sufficiently large to be worked to advantage and profit.

The stills now used in the largest establishments are made of prodigious size, and their peculiar advantage has already been described.

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\* In 1874.

These stills are made in the form of tanks, holding from 80,000 to 400,000 litres each.

The sides of the still are made of wrought-iron and the bottom of cast-iron, and it stands one hundred to two hundred charges before requiring renewal in part or in whole.

#### "CRACKING" OF PETROLEUM PRODUCTS DURING DISTILLATION.

This is a most interesting and curious chemical phenomenon, which takes place during the distillation of crude petroleum and its products, and was first noticed by Professor Silliman as early as 1855, in a report on the petroleum from Venango County, Pennsylvania. For many years it was doubted, but at the present time it is a well-received fact by chemists who are acquainted with the phenomena that occur in the rectification and purification of petroleum. No doubt, a portion of the hydrocarbons procured by the distillation of petroleum are already formed in the crude article, but there are new forms of hydrocarbons formed during the process of distillation, especially in the case of the less volatile products, which undergo a process called "cracking," where two or more hydrocarbons are formed out of one by what is supposed to be molecular change; this, however, will not explain the change: it is evidently something more. It is an actual decomposition, resulting in a deposit of carbon not unlike a destructive distillation, and I doubt the propriety of adopting this term "cracking," in the place of decomposition, until it is more clearly proved that heat will resolve a hydrocarbon of well-ascertained fixed composition (as may be known by the boiling-point) into simply two hydrocarbons of different boiling-points without deposit of carbon and evolution of hydrogen. The result of Warren's experiments, showing the possibility of obtaining hydrocarbons of fixed boiling-points with a large range of temperature between them, and their remaining the same after repeated distillation, would make us adopt the theory that, when a hydrocarbon is obtained during the distillation of petroleum that does not exist there previously, it is to be regarded rather as the product of destructive distillation than a simple rearrangement of the molecules of one substance in such manner as to constitute two others. For if we are to understand "cracking" in this sense, the homologous of marsh-gas cannot be cracked. The oxygen in crude petroleum doubtless has much to do in determining the character of some of the products of distillation, especially towards the end of the process.

But this part of the chemical examination of petroleum is yet to be made out, although much has been attempted in that direction. This

"cracking" of the heavier hydrocarbons into lighter ones and carbon was practiced in the arts before petroleum began to be rectified, but became very much more extended after the use of this latter product.

#### CONVERSION OF LIGHT NAPHTHAS INTO HEAVIER OILS.

This is said to be accomplished by heating the vapors of naphtha above their boiling-point. S. Dana Hayes made some experiments which tend to prove this by operating on oils made from naphtha, distilled at a temperature below  $149^{\circ}$  C. These very light oils were heated in an apparatus used for a special purpose in the arts, by which the vapor of the oils was held in suspension in the vapor of water under pressure afforded by steam over  $100^{\circ}$  C., but never so high as  $150^{\circ}$  C.; under these circumstances, light, uncondensable gases and vapors pass upward, and heavy oil falls downward into the naphtha below; and it was found that, the longer the vapors were held together in the apparatus, heated and under pressure, the more perfect were the decompositions, and from 2 to 10 per cent. of the heavy oil was obtained from the naphtha in different experiments. The heavy hydrocarbon oil obtained in this way has a dark yellowish-brown color and smells of the adhering naphtha when fresh; but after standing exposed to the air for a few days, it loses this odor, and becomes nearly neutral, or comparatively free from offensive odor. Its specific gravity varies from that of the adhering naphtha; its boiling-point is above  $400^{\circ}$  F. It does not evaporate at common temperatures, leaves a permanent greasy stain on paper, is a good lubricator for machinery, and, when redistilled at high temperatures, it breaks up into lighter and heavier liquid hydrocarbons, paraffine, and separated carbon. It is essentially a paraffine oil, like that of the same density obtained directly from petroleum or its heavy products by distillation.

When refining petroleum for illuminating purposes, it has been desirable to break up the heavier products and convert them into the light hydrocarbons generally known in commerce, in this country, as "kerosene"; and several forms of distilling apparatus have been devised for this purpose, in which the vapors of these bodies, by being heated above their boiling-points, are decomposed or "cracked" first into burning-oil entirely. But the apparatus used by Hayes demonstrates that light petroleum naphthas, and probably distilled naphthas from coal and other sources, may be "cracked" at a temperature below  $149^{\circ}$  C. into lighter and heavier products, the latter being paraffine oils that belong to a class of hydrocarbons entirely different from that of the original naphtha.

Through the kindness of Professor B. Silliman I have received a

copy of his report on the petroleum from Venango County, Pennsylvania. It is a memoir that has never been published in any scientific journal, containing the results of his extended investigation, made in the spring of 1855, being undoubtedly the earliest record of any chemical research on the distillations of this petroleum. And I take the liberty of quoting from it, because at this early date Professor Silliman found that the products obtained from petroleum are not simply bodies previously existing in the petroleum, but that they are new substances formed by heat and distillation. The author says, "The uncertainty of the boiling-points indicates that the products obtained at the temperatures named above were still mixtures of others, and the question forces itself upon us, whether these several oils are to be regarded as *educts*, or whether they are not rather produced by the heat and chemical change of an elevated temperature alone, which is sufficient to effect changes in the constitution of many organic products, evolving new bodies not before existing in the original substance." And farther on in the report, "The paraffine, with which this portion of the oil abounds, does not exist ready-formed in the original crude product, but it is a result of the high temperature employed in the process of distillation, by which the elements are newly arranged." When describing the properties of the illuminating oils distilled from this petroleum, Professor Silliman states the result of an experiment as follows: "Exposed for many days in an open vessel, at a regulated heat below  $100^{\circ}$  C., the oil gradually rises in vapor, as may be seen by its staining the paper used to cover the vessel from dust, and also by its sensible diminution. Six or eight fluidounces, exposed in this manner in a metallic vessel for six weeks or more, the heat never exceeding  $94^{\circ}$  C., gradually and slowly diminished, grew yellow, and finally left a small residue of dark brown, lustrous-looking resin, or pitchy substance, which in the cold was hard and brittle." The samples of oil employed were very nearly colorless. This is remarkable when we remember that the temperature of the distillation was above  $260^{\circ}$  C.

It is remarkable that in this early laboratory investigation Professor Silliman should have noted the production of entirely new bodies by the destructive distillation of petroleum, such as are now only produced in large quantities in manufacturing operations.

The "cracking" of petroleum, as a necessary result of its distillation in the large way, was not generally recognized or admitted for several years after this report was written, and even now there are many chemists who consider these as simply *fractional* distillations; but it is only necessary to mix the distillates together again and try

to produce petroleum to satisfactorily prove how different the products are from the original substance.

The petroleum upon which Professor Silliman reported as above did not yield any of the light naphtha to which I have referred, his lightest distillate having a specific gravity of .733, and a boiling-point above  $205^{\circ}$  C., probably because it had been floating on water exposed to the sun, or because it was thick "surface oil." Most of the petroleum, as now obtained from wells in Pennsylvania, yields by the first distillation, either by steam-heat or otherwise, about 15 per cent. of light naphtha, such as is commonly called gasoline, benzine, etc., which is entirely free from any greasy or oily constituent; and this light naphtha, by distillation at comparatively low temperatures, as described above, yields about 10 per cent. of its volume of heavy paraffine oil, a new substance produced by heating the vapors above the boiling-points of the naphtha, and not simply an educt.

It will be found that for oils of the same density, the lighter the temperature to which they are raised, or at which they are distilled, the lighter will be the product. And to produce an oil of a given density the heavier oil must be raised to a certain fixed temperature, the intensity of the heat depending on the lightness of the oil.

Downer accomplishes his results by slow fires and high stills, so that much of the products may condense and fall back upon the heated mass until converted into the requisite oil, when it will pass beyond the reach of the still, and he can thus produce from crude oil only naphtha, kerosene, and mineral sperm oil, without any lubricating oil.

Young adopts a method by which he works under pressure as much as seven atmospheres, operating upon mixtures of light and heavy oils, and obtaining a resultant product different from the original ones used.

#### USES OF PETROLEUM AS AN ILLUMINATING AGENT.

The most important application of the petroleum products is that of furnishing light, the oils used for lamps being those distilled above  $150^{\circ}$  C., and below  $250^{\circ}$  or  $280^{\circ}$  C. Above  $300^{\circ}$  C. it is useless for lamps, and used for lubrication or fuel.

Fats have been, from time immemorial, used as agents for producing artificial light, either in the form of liquids or solids, and, during the last thirty years, chemistry has done much to improve the manufacture of hard fats for this use, and the art of stearinery is now one of the most extensive and perfect of the chemical industries. But while this art has done much in improving and cheapening good

candles, it yet has not furnished a supply of light in sufficient quantity, or at low enough rates, to meet the wants of the masses of the inhabitants of the civilized world. So when petroleum, with fit apparatus for burning it, was presented to the public, it was greedily seized upon, since it furnished a beautiful light, at a very much lower price than that furnished by any other means.

The character of the light is readily appreciated by referring to the following tables:

*Examination of Illuminating Oils by the Judges of the Department of Chemistry of the American Institute, October, 1870.*

NAME OF OIL.	PRICE PER GALL.*	COLOR.	GRAVITY, BAUMÉ.	SPECIFIC GRAVITY.	BOILING-POINT. C.	FLASHING-POINT. C.	BURNING-POINT. C.
1st. Pratt's "Astral Oil"....	\$0.50	Colorless.	48.7°	0.792	149°	{ 50° 52° 54° 56° 58° }	58°
Downer's "Standard Kerosene".....	40	Faint straw.	45.7°	0.805	138°	{ 46.5° 46° 45° }	52°
Downer's "Mineral Sperm Oil".....	75	Yellow.	36°	0.849	191°	{ 127° 128° }	149°

\* The oils then cost more than they did in 1876.

*Series of Experiments on the Illuminating Power of these Oils.*

NAME OF OIL.	CAPACITY OF LAMP.	CUBIC CENTIMETRES OF OIL CONSUMED.	TIME.	CUBIC CENTIMETRES CONSUMED PER HOUR.	HOURS REQUIRED TO BURN ONE GALLON.	ILLUMINATING POWER OF FLAME IN STANDARD SPERM CANDLES.	AVERAGE ILLUMINATING POWER.—Candles.	POUNDS OF SPERM CANDLES EQUIVALENT TO ONE GALLON OF OIL.
Pratt's "Astral Oil".....	C. C. 680	485	H. M. 14 28	33.57	112.57	{ 8¼ candles after 48m. 7.8 " " 2h. 4.25 " " 14h. 28m. 4.20 " wick turned up. 8¼ candles after 48m. 7.9 " " 2h. 4.27 " " 14h. 25m. 4.52 " wick turned up. 4.8 candles after 48m. 7.9 " " 2h. }	7.9	14.80
Downer's "Standard Kerosene".....	630	435	14 21	30.33	124.71	{ 8¼ candles after 48m. 7.9 " " 2h. 4.27 " " 14h. 25m. 4.52 " wick turned up. 4.8 candles after 48m. 7.9 " " 2h. }	7.9	16.93
Downer's "Mineral Sperm Oil".....	395	370	12 35	29.36	128.71	{ 8¼ candles after 48m. 7.9 " " 2h. 4.27 " " 14h. 25m. 4.52 " wick turned up. 4.8 candles after 48m. 7.9 " " 2h. }	7.9	17.59

Yet this beautiful and cheap illuminator is not without drawbacks, terrible from the accidents and pecuniary loss it occasions. The public are nevertheless not intimidated or driven from the use of it; on the contrary, it is being employed more and more every day. Laws and ordinances are enacted to protect the public from accident, with but partial success. It is estimated that in the last ten years there have been 30,000 lives and \$20,000,000 of property lost by accidents from petroleum.



## CAUSES OF ACCIDENTS.

The cause of accidents is inherent in the material itself, but it is too often increased by carelessness or fraudulent design. From the first, viz., carelessness, but little protection can be afforded; but to prevent fraud police regulations are enacted.

These oils are simply mixtures of a variety of hydrocarbons, and it is from the vapor of the more volatile ones mixing with air in the interior of the lamp that dangerous explosions occur. The manner of testing burning-oils is well known to all technologists, so I will merely give a hasty review of some of the more ready and trustworthy methods. The following is a sample one recommended by Professor Attfield:

"Into a test-tube of thin glass 6 or  $6\frac{1}{2}$  inches long and  $1\frac{1}{8}$  inches in diameter, pour the liquid until the tube is half full. Stir the liquid well with a naked thermometer having the usual degrees marked on the stem, shaking, also, so as to keep the upper part of the tube well wetted with the liquid, and note the temperature. Now introduce a flame (of a thin splint of wood or, far better, a small gas-flame a quarter or an eighth of an inch long) into the mouth of the tube to within half an inch of the surface of the liquid, quickly withdrawing it, and noticing whether a thin blue flame runs between the test-flame and the surface of the oil. If not, warm the tube by passing the bottom of it gently through a spirit-lamp or other flame, or by dipping the lower portion of the tube into hot water, constantly stirring the liquid with the thermometer, frequently noting the temperature, and introducing the test-flame every minute or so. The temperature at which the thin blue flame appears will be the igniting-point of the petroleum,—the point at which it gives off inflammable vapor. To correct this result let the tube gradually cool, introducing the test-flame as before. The lowest temperature at which the vapor takes fire is the true igniting-point."

The directions for applying the flashing-test according to the Act of the English Parliament of 1868 are similar to the one used in America and elsewhere, only the nature of the apparatus being different in different countries. In these countries all mineral spirits or oil are legally burning oils when the flashing-point is below  $100^{\circ}$  Fah. in England and  $110^{\circ}$  in America.

A method which has been recommended by Professor Van der Wide deserves attention and critical examination, which it has not yet received, and for that reason I give it here. It is founded on the fact that all vapors given off by petroleum are combustible, and that if

any kerosene or other preparation from petroleum gives off a vapor at the standard temperature of  $110^{\circ}$  Fah. it is not necessary to try whether it will burn, but merely to collect it in a proper vessel, by which we gain the additional advantage that we may measure the quantity of the vapor, while none of it can be lost by air-currents incidentally passing over the surface of the liquid. He takes, therefore, a glass tube, closed at one end and open at the other, and fills it with the petroleum to be tested; then closing the open end with the finger, inverts it in a vessel with water warmed to  $110^{\circ}$  by mixing hot and cold water, and kept at that temperature by occasionally adding hot water. Any vapor given off will collect in the closed upper part of the tube, displacing the oil downwards. The amount of this gas will be a comparative test of the different qualities of oil, and the tube may be graduated in order to measure the amount. This method is not subject to the discrepancies found in the usual way of testing, in which an impure and dangerous quality of oil may be made to appear better than it is by slow and gradual heating, and in which a light draft of air may carry off the vapors as soon as developed, so that it becomes impossible to ignite them. This new method gives freedom from the danger of using fire, more accuracy, a trustworthy means of measurement, and no chance for deception.

In all the fire-tests much is yet required to be done to render the results uniform in the hands of different operators. For instance, Grace Calvert has shown very clearly that, following the Act of the English Parliament, a little difference in the time of making the experiment may cause a difference of the flashing of  $8^{\circ}$  to  $10^{\circ}$ , and in the other tests  $10^{\circ}$  to  $20^{\circ}$  between using a shallow and a deep vessel.

The temperature for flashing and igniting of a safe oil is placed at very nearly the same temperature in different countries, viz., from  $100^{\circ}$  to  $110^{\circ}$  Fah. I would here remark that more attention should be given by manufacturers to ridding petroleum of the volatile compounds; and in America, Downer and Merrill (manufacturers) are doing much in this direction.

#### USE OF PETROLEUM AS FUEL.

In the substitution of petroleum for coal, there are several points to be considered: 1st. The steam-producing power of equal weights of coal and petroleum. 2d. Comparative cost. 3d. Comparative cost of attendance in engine-room. 4th. Durability of apparatus. 5th. Comparative space of storage. 6th. Safety. The first two are beyond individual control, and therefore cannot be modified by human ingenuity. These we will consider in this report.

The steam-producing power of petroleum, based on the calculations of Favre and Silberman, is as follows: 1 pound carbon combining with  $2\frac{2}{3}$  pounds oxygen will evaporate 15 pounds of water at  $100^{\circ}$  C.; 1 pound hydrogen combining with 8 pounds oxygen will evaporate 64.2 pounds of water; and 1 pound petroleum, consisting of six parts of carbon and one of hydrogen, has for theoretical evaporating-power 22.02 pounds.

Allowing 20 per cent. of non-combustible matter in anthracite, 1 pound of it will evaporate theoretically 12 pounds of water; so that one part of petroleum is equal to 1.835 anthracite. A low price for crude petroleum in most markets in America would be 4 cents per litre, or 2 cents per pound, or \$40 (200 francs) per ton. Average price of anthracite in most markets in America, \$8; in some places it is as low as \$4 and \$5, in others \$12; but at \$8 per ton petroleum would cost, for equal heating-power, about three times as much as anthracite. But no simple conclusion can be come to in the application of petroleum at all places for heating purposes, about which more will be said farther on.

I would just here state that the practical results of the heating-power of petroleum, as made out by Deville and others, is but little more than one-half the theoretical calculation.

The formula given by Deville is the following

$$Q = \frac{(637 - T)P + K(t - t')}{M}$$

$Q$ —represents the heat of combustion.

$P$ —the weight of vapor produced in the generator, which is condensed by a worm.

$T$ —the temperature of the water furnished to the boiler.

$K$ —the weight of water which cooled the smoke and heated gases going out of the stack.

$t'$ —the temperature of the water at the entrance of the cooler of the chimney-stack.

$t$ —temperature of same in going out.

$M$ —the weight of the oil employed.

The apparatus to which this formula is applied is fully described in *Comptes Rendus* of the Academy of Sciences, 15th February, 1869, and consists of a well-constructed tubular boiler, carefully protected from the cooling action of the air on its surface, and having a cooler in the smoke-stack, consisting of a number of pipes with water circulating through them to take up the heat of the escaping gases and smoke from which the terms  $t + t'$  are obtained.

In putting the apparatus in operation the heating is continued until

all the quantities  $t-t'$ ,  $P$  and  $M$ , become absolutely constant, then the experiment is made for two or three hours, and we get with great precision the value of the heat of combustion  $Q$ .

There have been many experiments made recently in relation to the use of petroleum as fuel. According to some reports, it has been employed successfully on steamers and locomotives, also for heating large masses of iron, especially those large and thick sheets employed in the construction of war steamers. Yet we have no uniform evidence that it can be done with economy; and the comparative value of heating-power of coal and petroleum would certainly show that it cannot be, except, perhaps, in some rare cases. But the question of economy is not always the only one to be considered in certain of these heating operations: convenience is frequently of much importance to consider, and I shall give a short statement of what has been attempted in this direction, especially by St. Claire Deville in his elaborate experiment on a large scale. The report of Mr. T. Lloyd to the English Admiralty, after detailing his experiments made at the Woolwich dock-yard, goes on to say, with reference to the best specimens of oil tried,—“Suppose the Burslem and Torbaine oils could be worked under ordinary circumstances in marine boilers, they would give double the quantity of steam now raised from burning one pound of coal. It has been found practicable to burn these oils in Woolwich dock-yard without difficulty; but whether they could be used successfully and without accident at sea has yet to be proved.

“It is not impossible to provide against the contingency of fire, but the precautions taken must be strictly attended to by those who have the working of the engines.

“The prices of the oils experimented upon range from £10 to £23 per ton. This demand is a serious drawback to begin with; but if the demand were greater than now, they would, perhaps, be produced in larger quantity, and at considerably less cost. Moreover, the gain in weight of fuel carried would not compensate for its enhanced cost. The very lowest-priced oil would be far too dear to employ in the raising of steam. A ton of oil would take up less room than a ton of coal, and on distant stations there would be a saving of freight; but, even with this allowance, the price of oil places it quite out of the reach of steamship-owners. From engine-rooms there is generally an offensive smell of the oil used for lubricating, but we fear that if these mineral oils were burnt below in steam-vessels the nuisance would become almost unendurable. When burnt also in great quantities, the foul smoke and soot, when there is

no wind at sea and the air is dense, would be still more intolerable. For marine purposes, at all events, we are not near the time when oils will be burnt in steam-furnaces as a motive-power."

The price of oil, given by Mr. Lloyd, is considerably too high; still, at a very much diminished cost, it would be too expensive for such use.

The experiments made in the United States steam service gave similar results, and the conclusions arrived at by some experimenters were about those reached at Woolwich, while other experimenters give very different results, some of them incredible and apparently beyond all possibility.

The most trustworthy experiments that have ever been conducted are those made by St. Claire Deville, and reported to the French Academy of Sciences, and it would be well to give a summary of the results. The oils employed had been obtained from various natural sources, and the experiments also included the heavy oil from the Parisian Gas Company's works. The experiments have determined the following points: In twelve kinds of crude oils analyzed there was found to be from 82 to 87.1 per cent. of carbon, 7.6 to 14.8 per cent. of hydrogen, and 0.9 to 10.4 per cent. of oxygen. The heavy oil of the Parisian Gas Company has a specific gravity at 60° C. of 1.045, and at 31° C., 1.007. It is of a dark-brown color, and contains 82 per cent. of carbon, 7.6 per cent. of hydrogen, and 10.4 per cent. of oxygen, nitrogen, and sulphur. Heated to 216° C. only 12.5 per cent. volatilizes. It remains fluid at 11° C. A ton of it contains about 220 gallons, and its cost is about 50 francs per ton.

The amount of carbon added to the hydrogen contained in this fuel must make it a very powerful heat-generating combustible. It has nearly the lowest expansibility of all the oils, its co-efficient of expansion being 0.000743, the lowest co-efficient being 0.000652.

The most important experiments with the heavy oil were made with a locomotive of the Strasburg Railway Company. This locomotive has uncoupled wheels and outside cylinders. Its weight is 20 tons, and that of the tender is 15 tons. It has a heating surface of 72 square yards. The oil was supplied to the furnace from a tank, being fed by its own gravity. An additional supply was carried on the tender, wherewith to renew the supply in the tank as required. The fire was kindled by lighting some shavings and sticks on the floor of the fireplace, and at the same time admitting a small quantity of oil. A jet of steam was sent into the smoke-pipe from the blow-off pipe of another engine to increase the draft. It took an hour and a quarter to get up steam, during which time 11 gallons of oil were consumed. It was shown, however, that by

consuming  $12\frac{1}{2}$  gallons of oil steam could be got up in two and one-half hours, without assistance from another engine, but with the inconvenience of a large amount of dense black smoke.

On the first experimental trip it was found that a speed of 40 miles per hour was obtained, with a consumption of about 14 pounds of oil per mile. In a second experiment a train of 70 tons was drawn at a speed of 40 miles per hour, with a consumption of about 17 pounds of oil per mile. Subsequent experiments gave results not differing essentially from those mentioned.

The grate consists of twenty bars of iron cast in one piece, with channels for the oil to run down, and it is set perpendicularly before the furnace, which is lined with fire-brick. A separate cock supplies oil to each grate-bar. It is thus seen that with the heavy oil steam can be got up in about the same time as with coal; the combustion of the oil is not specially difficult to control; and that the consumption of oil, as compared with that of coal, is only about one-half by weight. It is stated that the fire-brick used to line the furnace suffered severely from the intense heat, but the effect upon the tubes, etc., of the engine does not seem to have been yet noted.

Déville remarks that only the heavy and thick-flowing kinds of mineral oil or petroleum, which are less inflammable, can be used to advantage for heating locomotives. The oil is tested by being heated to  $100^{\circ}$  C., after which a well-lit link is dipped into it. If the oil is of the proper kind the link will not set fire to the oil but will itself be put out.

H. St. Claire Déville gives the following rule for estimating the calorific effects of a given sample of oil, which, although it makes the theoretic amount a little larger than that found in practice, is near enough to ascertain the relative values of oils as fuel: First, the amount of carbon, hydrogen, and oxygen contained in the sample is found by analysis. Second, subtract from the hydrogen one-eighth of the oxygen, then multiply the difference by 344.62, and add to the product the quantity of carbon multiplied by 80.8, and this sum will be the number of heat-units in one kilogramme.

As a basis on which to calculate the cost of heating by petroleum, 50 francs a ton is too low to base the cost of the oil, except in very rare cases, and, besides, anything like a demand for that purpose would at once increase the market price.

Petroleum has also been used in furnace operations, especially for metallurgic purposes, and apparently with such success that it would be well to give the results in two or three places.

In all cases the petroleum is converted into vapor before being in-

troduced into the furnace. The results in the plate-burning furnace at Woolwich, England, from what is called vaporized creasote, are as follows :

Under ordinary circumstances, the armor-plate-bending furnace is lighted from four to five hours before the plate is placed in it. The time occupied in heating the plate for bending depends upon its thickness,—one hour per inch of thickness being allowed. Taking, then, a 6-inch plate, we get from ten to eleven hours from the time of starting before the plate is ready for bending. Let us now see what the liquid fuel will do. The cold furnace is lighted, and after an hour is deemed sufficiently heated. A 6-inch armor-plate, 7 feet 6 inches long by 3 feet wide, is then consigned to the furnace, and after an hour and a half is drawn out thoroughly heated and ready for bending. Thus, in two hours and a half we have the work of ten or eleven hours completely and satisfactorily performed. Nor is this all; the advantages of the system do not stop here. The plate is remarkably free from scale, which can only be accounted for by the absence of the deteriorating influence of the products of combustion in the ordinary furnace. Another valuable result arises from this same cause,—thinner plates, when heated by liquid fuel and bent double, show no signs of cracking, as they usually do when they have been heated in the coal-furnace. This important feature is said to save ten shillings per ton on the metal, which amount it would lose in value by deterioration under the ordinary method of treatment. The vaporized creasote is supplied to the furnace from the generator by six jets, which are led in through small openings, by which means just a sufficient quantity of atmospheric air is admitted to support combustion. This method of supplying the heat also offers another advantage,—it can be applied to the whole or any portion of the plate. Thus, if a plate requires to be bent at one end only, then the heat is directed to that part. Further, the rate at which the metal is heated can be regulated to a nicety by increasing or diminishing the number of jets. The consumption of oil at Chatham is 108 gallons per furnace per day. Close beside the armor-plate furnace is another one for heating thinner plates, which has been regularly at work for some time past. It is heated by four jets, and is supplied, as the larger one, from the generator, which is placed between the two. The average time occupied in heating was seven minutes; with the ordinary furnace it takes from twelve to fifteen minutes for each plate. In the working of this furnace we have some remarkable results, which must lead us to expect further and even more important improvements in the application of the system.

The following is the result of a furnace of a similar character at the Laclede Iron-Works, St. Louis, Missouri, used for re-heating iron for rolling, etc.:

Total amount of iron in furnace . . . . .	Pounds	26,378
Amount taken out after being rolled . . . . .	"	24,524
Loss . . . . .	"	1,854
Loss on the same amount of iron in coal-furnace . . . . .	"	2,901
Thus saving in iron alone by the use of gas . . . . .	"	1,017
Which, at $3\frac{1}{2}$ cents per pound, would amount to . . . . .		\$36.64*
Cost of fuel (gas) . . . . .		42.50
Deduct saving in iron . . . . .		36.64
Cost remaining . . . . .		5.86
Cost of coal to make the same amount of iron . . . . .		24.52
Iron placed in scrap-furnace . . . . .	Pounds	7,950
Taken out . . . . .	"	7,751
Loss . . . . .	"	199
Loss with coal, 15 per cent., or . . . . .	"	1,192
Deduct loss with gas . . . . .	"	199
Saving of iron by use of gas . . . . .	"	993
Which, at $2\frac{1}{2}$ cents per pound, would amount to . . . . .		\$24.82
Cost of fuel (gas) . . . . .		21.25
Saving above cost of fuel . . . . .		3.57

As to time, it is also stated that in the scrap-furnace less than one-half the time is necessary to complete a blast with coal as by the gas. In the ordinary preparation of a blast, the time required by coal is from an hour to an hour and a half, while by gas thirty or forty minutes are sufficient. And besides the demonstrated economy of the gas, its cleanliness was a scarcely less important feature, as evidenced in the total freedom of the smoke-stacks from smoke and cinders.

The deductions to be made from the various experiments in the use of petroleum as fuel are, 1st, that it can be employed successfully; and, 2d, there are circumstances under which it can be used with advantage and economy, especially in metallurgic operations.

I have not referred to the use of petroleum in engines, in a manner similar to that employed in gas engines,—viz., by burning it in the cylinder,—but will leave that to the report on the mechanical department.

#### OF THE USES OF LIGHT PETROLEUM OILS.

Besides being used for burning and heating, the lighter products from petroleum are used for various purposes: for dissolving caoutchouc; for making varnishes with the different gums; for mixing with paints. Gasoline and the lightest naphthas are used to mix with

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\* These prices of iron are much higher than now.



air in the form of vapor, which mixture is used as a substitute for the illuminating gas.

#### USES OF PARAFFINE.

Among the more important applications of paraffine may be enumerated its use for laundry purposes,—when added to starch it imparts to it an additional lustre in the same manner as spermaceti or white wax; it has been found to be an effective preservative of wood, and large quantities are consumed in this industry; as chewing-gum (the softer variety of paraffine). Although this is apparently a very trivial and non-important article, it is in reality sold in enormous quantities by many of the wholesale confectioners, one manufacturer of chewing-gum alone using 70,000 pounds in one year. The manufacturers of friction-matches are heavy purchasers of paraffine, which they use for impregnating the sticks, so that they will more readily ignite and burn with greater uniformity. Of late, paraffine is also beginning to be used extensively for the purpose of sizing various textile fabrics. Paraffine-candles are well known, and they are confidently asserted to produce finer light than any other variety.

Confectioners also use paraffine to impart a gloss or lustre to some of their bonbons, such as cream-chocolate drops and others. Paraffine has in addition been used for water-proofing various woven goods; for coating the interior of wine- and beer-barrels; for the preservation of fresco-paintings; for the purpose of saturating cork and paper; as a sizing or finish for leather and small articles turned from wood and bone; as a preservative of fruits; and for many other similar applications.

An establishment in Hartford, Connecticut, makes its silk water-proof with a solution of paraffine in naphtha, so that even ice-cream can be spilled on a rose- or violet-colored silk without injuring it. Umbrellas and felt hats are also thus rendered water-proof. In the south of France it is now used largely to replace lard in retaining the odor of flowers, by being fused with the petals.

#### MISCELLANEOUS.

##### THE ACTION OF LIGHT ON MINERAL OILS.

Some interesting experiments were made by M. Grotowsky on the action of sunlight on mineral oils; I do not know that they have ever been repeated. His experiments go to show that under the influence of the sun mineral oils possess the property of absorbing oxygen from the air and converting it into ozone. No chemical combination takes place, for the ozone remains free, and easily oxi-

dizes any bodies placed in contact with it. The odor of these oils when containing ozone is completely modified; they are incapable of burning, and, moreover, act injuriously and rapidly upon cork stoppers.

The color of the glass vessels containing the oils influences considerably the absorption of oxygen. After an investigation, extending over three months, results have been obtained confirmatory upon the following points:

1. The photogenic, or solar oil (a commercial brand of petroleum), preserves all its properties intact when inclosed in iron barrels.

2. When inclosed in vessels of white glass and protected by straw, little and but slightly injurious modification was apparent.

3. Vessels of white glass painted black were not sufficient to protect the oil from absorbing traces of ozone; but the stoppers were not attacked.

4. Vessels of white glass, unprotected. In these the oil became much charged with ozone, and burned very badly; in color it became of a very marked yellowish tint, and its density increased by 0.003.

5. Vessels of green glass, unprotected. The oil became charged with ozone, but burned well notwithstanding; the cork stoppers were attacked, and the color of the oil became modified.

6. Vessels of green glass painted black. Ozone was absorbed, but no apparent modification was appreciable.

7. Vessels of green glass covered with straw. Traces of ozone were apparent, and the oil assumed a slight yellowish tint. No defect was, however, to be observed in burning.

8. American petroleum, inclosed in vessels of white glass, unprotected, was much charged with ozone, and would scarcely burn in consequence; it became of a yellowish tint, and its specific gravity was augmented by 0.005.

9. The same oil, screened from the access of light, underwent no change.

#### HOW TO JUDGE THE QUALITY OF GOOD BURNING-OIL.

Good petroleum should have the following characteristics:

1. The color should be white or light yellow, with blue reflection; clear yellow indicates imperfect purification or adulteration with inferior oil.

2. The odor should be faint, not disagreeable. The specific gravity at 60° Fah. ought not to be below 0.795, nor above 0.84.

3. When mixed with an equal volume of sulphuric acid of the density of 1.53, the color ought not to become darker, but, on the contrary, lighter.

A petroleum that satisfies all these conditions and possesses the proper flashing-point may be set down as a pure and safe article. To test the color, care should be taken to select a glass bottle of good quality, perfectly white and clear.

#### TRANSPORTATION OF PETROLEUM.

In America, the crude petroleum is now most commonly transported from the source in large iron tanks constructed on railway trucks, or in what is called bulk-boats, the boat itself being but a large tank, into which the oil is run from the immense reservoirs situated at points near a railroad or river navigation.

Sometimes the wells supplying these tanks are six or eight miles distant, and the oil run to them by large iron pipes underground. In some places the crude oil is also sent in wooden barrels of about 160 litres capacity. The refined is almost invariably sent in wooden barrels of the size just mentioned, and when properly charged, due allowance is made, by space in the barrels, for expansion of the oil to the possible range of temperatures to which it is likely to be subjected; too much precaution cannot be taken, for very serious accidents have resulted from not attending to it. Knowing the co-efficient of dilation of the oil, the exporter can easily calculate the vacant space to be left, for any range of temperature from 0° to 50° C. will doubtless meet the requirements of any case. Deville furnishes us with the following formula:

$$V \times K \times 50.$$

$V$  being the volume of the vessel.

$K$  the co-efficient of expansion.

The principal danger in transportation is from the more volatile parts of the oil, those boiling under 120° C.; for even after due allowance is made for expansion, the vapor of these oils may escape through crevices in the barrel and mix with the surrounding atmosphere in a closed space, as the hold of a vessel, thus forming a compound that will explode on the approach of a light.

#### SOLIDIFICATION OF PETROLEUM.

Some experimenters have sought means to solidify petroleum, so as to facilitate its transportation, but without any practical result, nor is there any hope that this will ever be accomplished.

The efforts have been directed to mix certain mucilaginous agents with it, and some of them have a curious effect upon it. Small quantities of the gluten of flour or the albumen of egg, when mixed with a little water and then shaken with petroleum, will make a stiff mucilage of it. But the most curious effect is produced by the *Saponaria*,

belonging to a class of herbaceous plants of the family of Caryophyllus; the powder of almost any part of the plant, first digested with a small quantity of water, then added to even the lightest oils and shaken with them, in a few minutes forms a very thick mucilage, so that the flask in which the experiment is made may be inverted without its contents flowing; but a more singular thing is, that if we now add a few drops of carbolic acid to the mucilage and agitate, in a few minutes it will become perfectly limpid. This experiment I have repeated, but can see no practical value in it.

#### NATURAL GAS IN PENNSYLVANIA.

As this belongs to the group of natural hydrocarbons that may be used either for illumination or heating, it is proper to treat of it in connection with petroleum. The escape of this form of gas from the earth, by perforating its surface to a greater or less depth, has been known in various parts of the world from time immemorial; but the escape of such vast quantities as occur in the regions about to be referred to has never been remarked before the extended exploration of Western Pennsylvania petroleum.\*

The principal gas-wells of Pennsylvania are situated in Butler County, latitude  $40^{\circ} 30'$ , longitude  $80^{\circ}$ ; it is also found in the neighboring counties, but in less quantity. The facts in connection with the escape of gas were known for some time before application was made of it. The most important wells are the Burns and Delamater wells.

**THE BURNS AND DELAMATER WELLS.**—These are about a half-mile apart, in the county of Butler, and thirty miles from Pittsburgh, in a straight line. They are fifteen miles from the Harvey wells, from which last the gas is conducted to Pittsburgh to the iron-works of Spang, Chalfant, & Co., and Graff, Bennett, & Co. Their depth is about 1600 feet; they have been bored to the fourth sand-rock, so well known to those engaged in boring for petroleum.

The Burns well has never produced oil, but the Delamater well was first bored to the third sand-rock, and was for a time a ten-barrel well; it was afterwards bored to the fourth sand-rock, and furnished gas under such pressure that the boring-rod, weighing 1600 pounds, could be drawn from the well by hand. Each of the wells is of a  $5\frac{5}{8}$ -inch bore. The Delamater well is the more remarkable of the two, producing nearly twice as much as the Burns well, furnishing light and fuel to all the neighborhood, including the village of Saint Jo.

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\* This gas has been used in the United States principally at the salines for generating steam for their pumping-engines, and for evaporating the water in making salt.

It is situated in a valley surrounded by mountains, which reflect and concentrate the light produced by the gas. Several pipes lead from the well; one conducts the gas directly to the cylinder of a powerful engine, which is set in motion at a great speed by the pressure of the gas, and the gas from the escape-pipe, when lighted, gives a flame of great length. Another tube near the engine allows an immense volume of gas to escape, the combustion of which is said to represent one-half the heating capacity of all the blast-furnaces in Pittsburgh. At sixty feet farther is the principal escape of the well, with a tube 3 inches in diameter, from which burns a flame forty feet in height, the noise of which appears to shake the surrounding hills. Within a radius of fifty feet the ground is burnt; but, at a little greater distance, vegetation is as abundant and vigorous as in the tropics, and seems to enjoy a perpetual summer. During a calm night the noise is heard at fifteen miles' distance. At four miles' distance it sounds like the passing of a train of cars; and this noise grows louder and louder as we approach the well, until at last it resembles the escape of steam from a thousand locomotives. At one-eighth of a mile it is like the roaring of cannon, and the human voice is heard with difficulty, and the tongues of flame launch themselves to a height of seventy feet. In winter the hills are covered with snow, but on two acres around the well the herbage is green and fresh, except very near the well, where the ground is burnt. In this description I give the observations of those who have visited these wells.

**PRESSURE AND AMOUNT OF GAS.**—I am indebted to Mr. O. Wath for the facts under this head, the result of careful observation on his part. At the wells, in a tube  $5\frac{5}{8}$  inches diameter the pressure is 100 pounds to the square inch. In a smaller tube it exceeded 200 pounds. In a 2-inch tube that conducts the gas to Freeport, fifteen miles from the well, the pressure is reduced from 200 to 125 pounds, from which it is concluded that, by employing a tube of  $5\frac{5}{8}$  inches diameter, with the original pressure at the well of 100 pounds, the loss occasioned by the friction in the passage from the wells to Pittsburgh (thirty-five miles) would be about one-half, so that the pressure would be 50 pounds per square inch at Pittsburgh.

The rapidity of the escape of the gas from the well is in round numbers 1700 feet per second, and if this be multiplied by the surface of the tube, we have indicated an escape of 289 cubic feet per second, or 17,340 cubic feet per minute, in round numbers *one million of cubic feet per hour*. The quantity of gas furnished daily is then about 1408 tons; this estimate is from one of the wells, and it is not considered too high an estimate to place that of all the wells at 3000 tons daily.

Burns's well, when I obtained the information, in the latter part of 1875, had been running 300 days, and during that time there had escaped and gone to waste the equivalent of 300,000 tons of bituminous coal.

**DURATION OF THE GAS-WELLS.**—Some, we know, give out very soon, but in the upper oil region there are wells which have furnished gas for twelve years without diminution. One well at Fairview has furnished fuel to one hundred machines during five years, and the production to-day is the same as at first.

**ILLUMINATING AND HEATING VALUE.**—According to Mr. O. Wath its illuminating power is  $7\frac{1}{2}$  candles; its calorific effect is 25 per cent. more than an equal weight of bituminous coal.

**ECONOMICAL APPLICATION OF THE GAS.**—The art of taking advantage of this abundant source of combustible is in its infancy. The gas from the two great wells has been applied as already stated. At Pittsburgh there are two iron-works (Spang, Chalfant, & Co., and Graff, Bennett, & Co.) using the gas from what are known as the Harvey wells, about fifteen miles from that city, and this is the most extensive application made at the present time. This last well is bored to the second rock, to a depth of 1200 feet; its diameter is  $5\frac{5}{8}$  inches; owing to imperfect tubing on the route the gas arrives at the works under a very much diminished pressure. It is used in the above establishments for puddling iron, and it is said to wear out the furnaces less rapidly than coal, and to economize four hours on each furnace.

A company is formed to bore wells in the city of Pittsburgh, on the north side of the Monongahela, and propose commencing work at once; another is formed for working on the south side; and a third is formed, with a capital of \$500,000, to bring the gas from the Delamater & Burns wells, a distance of thirty-five miles.

**COMPOSITION OF THE GAS.**—The gas from four of these wells has been carefully examined by Mr. S. P. Sadler, of the University of Pennsylvania, and we can rely on the accuracy of the following results:

	Burns Wells, Butler Co.	Lechburg Well, Westmoreland Co.	Harvey Wells, Butler Co.	Cherry-tree Wells, Indiana Co.
Carbonic acid . . .	0.34	0.35	0.66	2.21
Carbonic oxide . . .	trace	0.26	.....	.....
Hydrogen . . .	6.10	4.79	13.50	22.50
Marsh-gas . . .	75.44	89.65	80.11	60.27
Ethylene . . .	18.12	4.39	5.72	.....
Hydrogen, carburetted	.....	0.59	.....	.....
Oxygen . . .	.....	.....	.....	0.83
Nitrogen . . .	.....	.....	.....	7.32
	100	100	99.99	100

## CONCLUSION.

In conclusion, I would say that I have omitted many things in this report that might be of interest; but what has been omitted here is principally such matter as may be found in reports of previous Exhibitions. I have not attempted to map out the general distribution of petroleum over the surface of the globe, for this was well done by M. Daubrée in his report on bitumens and mineral oils for the French Exposition of 1867.

Much in this report will doubtless be familiar to most readers, but, to give anything like connection to the manner in which petroleum is here treated, this could not be avoided.

The litre measure is used very frequently in this report, as it is understood by most persons in this country, and is used exclusively in Europe.

## CHEMISTRY.

BY J. LAWRENCE SMITH.

It was not to be expected that the display of chemical products, properly so called, would be as marked as that made at the several previous universal Expositions at London, Paris, and Vienna; yet it was evident to all members of the Jury that the various exhibits both from Europe and this country possessed marked interest. England, France, and Germany sent specimens of the finer chemical products, which equaled any that had been previously exhibited, and many of our own manufacturers made displays in this as well as in other classes of chemicals which for beauty of material and taste in arrangement have never been surpassed, exciting the admiration of the foreign Judges.

A noticeable fact in connection with the finer chemicals was the economy that had been introduced in their production during the past few years, and different countries are now rivaling each other in bringing to bear the largest amount of activity and intelligence in accomplishing this end.

The United States was more conspicuous in the Exhibition by her manufactures of the grosser products, dependent upon chemical industry, as the strong acids, alum, artificial manures, borax, soda from cryolite, candle-stuffs, petroleum, etc.

## STRONG ACIDS.

The production of these acids, especially sulphuric acid, has necessarily taken a very extensive development, for upon them depends the execution of a vast number of processes in the arts, and from necessity these cheap and bulky chemicals must be produced at home. Sulphuric acid is now manufactured at a price approaching that for which it is made in Europe, the extinction of the tariff on crude sulphur having had much to do with this; also pyrites is now being utilized in two or three places for this purpose.\*

In later years, the very much increased demand for sulphuric acid has been brought about by the increased production of the superphosphates for manure, and the purification of petroleum. For the last purpose alone it is estimated that about eighty millions of pounds of 66° Baumé are used annually in this country.

The principal improvement of late years in the manufacture of this acid is the diminution of the amount of nitric acid required, it having been reduced from 5 to 2 per cent. of the sulphuric acid produced. The immense advantage of this can be realized when it is stated that there are one million of tons of sulphuric acid produced annually in Europe. The entire quantity made in this country has not been properly collated. There was also an exhibit, in this connection, of the apparatus of Faure & Kessler, of Clermont, France, for concentrating sulphuric acid, in which apparatus more than one-half of the platinum is substituted by lead, reducing the cost of a still of given dimensions to one-half the price of a platinum-still. I made mention of this apparatus in my report on the Vienna Exposition, and since that time I understand that its use has been extended.

## SODA SALTS.

These salts were exhibited by several manufacturers, but two only deserve special notice on account of the novelty of the manufacturing processes.

That of the Pennsylvania Salt Company, near Pittsburgh, where the cryolite of Greenland is used in large quantities for this purpose,—the mineral being imported from Greenland,—the company having certain monopoly arrangements with the Danish Government for 6000 tons of cryolite. It costs this company about twenty dollars per ton,

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\* There are large deposits of sulphur in Nevada and other places west of the Rocky Mountains that will one day play a very important part in the manufacture of sulphuric acid.



delivered at their works, and each one hundred tons of 90 per cent. cryolite yields 65 tons of dry carbonate of soda and 20 tons of alumina; this last being used in making sulphate of alumina and alum, etc.

The details of the manufacture of soda from cryolite were given by me in my report on the Paris Exposition of 1867.

There was also an interesting exhibit of carbonate of soda, prepared by what is known as the ammonia process of Solvay & Co., of Vangeville, Belgium; a process that is likely to be of interest to manufacturers in this country, for I believe that there is very little prospect of an early introduction into the United States of the manufacture of soda ash by the process of Le Blanc.

#### POTASH.

A point of some interest in connection with the chemical manufacture of this country is in connection with the reversal of the scale of production of carbonate of potash. In former years America and Russia produced the greater portion of this substance, used in the arts in all parts of Europe and this country, but now Germany furnishes to the world, and sends even to this country, large amounts of carbonate of potash made from potassium chloride of the extensive beds of this substance existing in the salt mines of Stassfurt, which chloride is worked in Germany and France by the Le Blanc process for potash carbonate.

#### BORAX.

If the United States have lost to a great extent their production of carbonate of potash, they have gained within a few years the ascendancy in a product never before furnished to the world by this country. The substance is borax, which exists in large quantities in California and other of the States west of the Rocky Mountains. The earth in and around the well-known Borax lake of California yields from 20 to 40 per cent. of this salt; and the material exposed to view is estimated to contain ten millions of tons of borax.

#### THE FINER CHEMICALS.

The chemicals belonging to this class have been treated of in detail by Professor Mallet, of the University of Virginia, so I will only allude in this summary to one or two that are products of the higher chemical skill, and are prominent marks in the history of applied chemistry.

One of these products, and one of very recent date, is Alazarine, of which there was a beautiful display, with all the intervening pro-

ducts between the coal-tar and the beautiful crystalline product that nature had only produced before by the mysterious changes in the growth of the madder-plant. The artificial production of this substance is increasing daily, and replacing the natural madder-dye, by which a large amount of soil used in the cultivation of the madder-plant is now turned to other uses for the benefit of mankind.

Another artificial product, only known formerly in connection with the vegetable kingdom, was exhibited for the first time at an International Exhibition, viz., Vanilline, identical in all respects with that obtained from the vanilla bean; this substance is of such recent production that it is not generally known. It is made by certain chemical operations on the cambium from some of the coniferous plants. This cambium contains a glucoside,  $C_{16}H_{12}O_8$ , which was discovered many years ago by Hartwig. This glucoside is split up under the influence of synaptase ( $H_2O$  entering into the combination) into glucose,  $C_6H_{12}O_6$ , and a crystalline compound,  $C_{10}H_{12}O_3$ . This last, when treated with oxidizing agents, is transformed into acetic acid and vanilline,  $C_{10}H_{12}O_3 + 2O = C_2H_4O_2 + C_8H_8O_3$ . This substance was discovered by Hermann and Tiemann, and the latter chemist has since produced it by oxidizing the essential oils of cloves, of myrtle, and of cinnamon. There is yet a third method devised by the same chemist, where potash is made to act on a mixture of chloroform and guaiacol, which last is a resinous matter, obtained from guaiac-wood and from beechwood tar. Fine specimens of this vanilline, pure and mixed with sugar, were on exhibition, and it is now finding its way into use as a substitute for the Mexican vanilla.

Salicylic acid is another one of the rare chemical products that has been cheapened very much in its production in the last few years, and is finding important application in medicine and in the arts.

In this summary I cannot even mention the important exhibits of colors, sugars, manures, organic acids, etc., that formed a prominent feature of the chemistry of the Centennial Exhibition, especially the American portion of it, but will conclude it by some remarks of M. Kuhlmann, *filz*, made in his report to the French Government, in connection with the chemical arts of the country:

"The rapid examination which we made of products of the chemical arts in the Exposition at Philadelphia established very clearly the remarkable development of this industry in the United States. We do not hesitate to say that this rapid progress in manufactures appeared to all the members of our Jury the most interesting and most characteristic feature of this Exposition.

"We do not exaggerate in saying that the soil of the United States

contains the elements of nearly all the great industries to a most extended degree.

"The mines of iron, copper, silver, and gold seem to offer inexhaustible resources.

"Petroleum, this great source of heat and light, has brought and will bring great wealth to that country.

"Coal, the vital element of all the industries, is found in vast quantities, and is easy of exploration. It is estimated that the coal-basins cover more than ten millions of acres, and at Pittsburgh it costs but one dollar per ton.

"Anthracite, the exploration of which represents one-third of the fuel extracted from the mines, enters largely in working iron-furnaces and conducting other metallurgic operations.

"Furthermore, the means of transportation are admirably organized in the United States. The net-work of railroads represent upwards of eighty thousand miles. Rivers traverse it in all directions, furnishing cheap transportation for coal and ores.

"Salt and sulphur are found as yet only to a limited extent ; but there is native sulphur and an abundance of pyrites in the United States, which must at some period play an important part in the chemical industry of that country.

"It is very evident that the industrial arts in America will not only very soon supply her own wants, but that there will come a time when the course of trade will be reversed, and they will send to the Old World their excess of production. We should be amazed to see any cessation in the progress of that energetic nation, so enterprising and determined ; having faith in their institutions, which are in general well adapted to the nature of the people, that seeks to educate all classes, and which has been blessed beyond all other nations by the variety and richness of their agricultural and mineral resources."

In concluding this summary, I must say that M. Kuhlmann has not overstated the resources of this country, which should excite in us more a feeling of gratitude than pride, and a sense of our great responsibility as a nation. For much has been given us, and much will be required of us.

# REPORTS ON AWARDS.

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## GROUP III.

### 1. Browning & Brothers, Philadelphia, Pa., U. S.

ACETIC ACID, BROWN SUGAR OF LEAD, DYEWOODS, AND EXTRACTS DYEWOODS.

*Report.*—Commended for excellent quality of the exhibited articles.

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### 2. O. S. Follet, New York, N. Y., U. S.

CHEMICALS.

*Report.*—Commended for chemically pure acetate of lead, in crystals of extraordinary beauty and size, for pure vinegar of fine flavor, for chloroform free from acid, made by an improved process, and for a fine display of white lead and chrome pigments.

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### 3. Alfred L. Hance, Philadelphia, Pa., U. S.

PHOTOGRAPHIC PRODUCTS.

*Report.*—Commended for the fine quality and high reputation of his pyroxyline, also for his ground glass substitute and various collodion mixtures, highly approved by photographers.

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### 4. Charles Pfizer & Co., New York, N. Y., U. S.

CHEMICALS.

*Report.*—Commended for fine display of various chemical products, organic and inorganic, used chiefly in pharmacy, including more especially tartaric acid and its salts, permanganate of potassium, bromide and iodide of potassium, gallic and tannic acids, strychnia and santonine.

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### 5. Rosengarten & Sons, Philadelphia, Pa., U. S.

CHEMICALS.

*Report.*—Commended for the purity and general excellence as commercial products of a great variety of chemicals, inorganic and organic, used chiefly in pharmacy, and especially for a fine display of various salts of morphia, and of the different cinchona alkaloids, including quinine, quinidine, cinchonine and cinchonidine.

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### 6. T. & H. Smith & Co., Edinburgh, Scotland.

CHEMICALS.

*Report.*—Commended for excellence of quality of chemical products (some of them first discovered by the exhibitors) extracted from vegetable and animal kingdoms, and more especially for the variety and purity of those extracted or obtained from opium, including several of great rarity not elsewhere exhibited.

**7. T. Morson & Son, London, England.**

## CHEMICALS.

*Report.*—Commended for the production, in a pure state, of certain special chemicals used in pharmacy, and more especially of aconitine and its salts.

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**8. A. W. Gerrard, London, England.**

## CHEMICALS.

*Report.*—Commended for the production, in fine state, of certain special chemicals used in pharmacy, and especially of chrysophanic acid from gall-powder, and of pilocarpine, a new alkali first extracted by the exhibitor from jaborandi.

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**9. F. C. Calvert & Co., Bradford, Manchester, England.**

## CARBOLIC ACID.

*Report.*—Commended for the production of chemically pure carbolic acid of high fusing point, also for extensive production of improved commercial carbolic and cresylic acids and of the so-called sulpho-carbolates in various forms; also for production of the carbolic acid dye products, picric acid, and aurine in a pure state.

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**10. C. Hoff, New Caledonia, New South Wales, Australia.**

## CHEMICALS.

*Report.*—Commended for quality of indigo exhibited, and for its production from native sources.

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**11. Lyman Brothers & Co., Toronto, Ontario, Canada.**

## CHEMICALS.

*Report.*—Commended for excellence of quality of various chemicals used in pharmacy.

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**12. Modeste Kittary, St. Petersburg, Russia.**

## CARBOLIC ACID PREPARATIONS.

*Report.*—Commended as very useful preparations of carbolic acid for disinfection, both in a liquid and dry form. These preparations are very largely used in the army and navy and in the hospitals of Russia.

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**13. Peter Ooshkof, Elabouga, Viatka, Russia.**

## CHEMICALS.

*Report.*—Commended for excellent quality of bichromate of potassium, blue vitriol, ferrocyanide of potassium, and alum.

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**14. Nicholas Lepeschkin, Moscow, Russia.**

## CHEMICALS.

*Report.*—Commended for variety of chemicals and garancine, of good quality.

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**15. A. K. Shlippe, Plesna, Moscow, Russia.**

## CHEMICALS.

*Report.*—Commended for a very creditable exhibition of numerous chemicals.

**16. United States Salicylic Acid Works, New York, N. Y., U. S.****SALICYLIC ACID.**

*Report.*—Commended for salicylic acid in powder, crystals, and sublimed, in excellent quality, prepared by Kolbe's process, from carbolic acid.

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**17. Charles Torchon, Paris, France.****CHEMICALS.**

*Report.*—Commended for a display of different hydro-carbons, and especially for a specimen of synthetically produced petroleum.

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**18. Dr. W. Haarmann, Holzminden, Germany.****ARTIFICIAL VANILLINE, CONIFERINE, AND PRODUCTS CONNECTED THEREWITH.**

*Report.*—Commended for the first artificial production of vanilline by synthesis and its introduction into commerce on a practically useful scale, this constituting one of the most distinct novelties in chemical industry presented in this International Exhibition, and one of the most interesting results of modern organic chemistry.

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**19. H. Trommsdorff, Erfurt, Germany.****CHEMICALS.**

*Report.*—Commended for the beauty of the display of pure chemical products, of scientific as well as of technical importance.

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**20. Saame & Co., Ludwigshafen on-the-Rhine, Germany.****CHEMICALS.**

*Report.*—Commended for the character of the chloral compounds exhibited, and for the large development of the manufacture of chloral hydrate and its associated bi-products.

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**21. Dr. Theo. Schuchardt, Görlitz, Germany.****CHEMICALS.**

*Report.*—Commended for the fine quality of metallic oxides used for coloring glass; also for a most varied display of rare and fine chemical products.

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**22. Friedrich Jobst, Stuttgart, Germany.****CHEMICALS.**

*Report.*—Commended for fine quality of different preparations of the alkaloids extracted from opium and from Peruvian bark, and for the scientific development of the process of extraction of the alkaloids.

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**23. L. C. Marquart, Bonn, Germany.****CHEMICALS.**

*Report.*—Commended for excellence of collection of pure chemicals used in pharmacy and in the laboratory operations of scientific chemistry.

**24. C. A. F. Kahlbaum, Berlin, Germany.**

## CHEMICALS.

*Report.*—Commended for the character, variety, and scale of production of numerous alcoholic compounds of different kinds, by the introduction of which into commerce the progress of scientific chemistry has been materially assisted.

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**25. Chemical Manufacturing Co. (formerly E. Schering), Berlin, Germany.**

## CHEMICALS.

*Report.*—Commended for the fine quality and great variety of both organic and inorganic chemistry exhibited, and for the development of the manufacture of rare chemical products.

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**26. Dr. F. Wilhelmi, Reudnitz, Germany.**

## CHEMICALS.

*Report.*—Commended for the excellence of the display of essential oil of bitter almonds, produced artificially, on a manufacturing scale, from coal-tar naphtha; and for exhibition of allied products.

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**27. Johannes Herzog, Bremen, Germany.**

## PHOTOGRAPHIC CHEMICALS.

*Report.*—Commended for the excellent reputation they have with those who use them.

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**28. F. von Heyden, Dresden, Germany.**

## CHEMICALS.

*Report.*—Commended for the quality and scale of production of artificial salicylic acid, essential oil of wintergreen, and other salicylic compounds exhibited, produced by the process patented by Prof. H. Kolbe, of Leipsic.

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**29. Liver Alkali Works Co. (Limited), Liverpool, England.**

## CHEMICALS.

*Report.*—Commended for caustic soda, three grades.

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**30. Ruffer & Co., Breslau, Germany.**

## CHEMICALS.

*Report.*—The products exhibited consist of oxides of zinc, chromate of zinc, and sulphide of cadmium. They recommend themselves by their purity.

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**31. Solvay & Co., Varageville-Dombale, France.**

## CHEMICALS.

*Report.*—Commended for the salts of soda, of superior quality, manufactured by the action of ammonia and carbonic acid on brine from the rock-salt mines, and for the improvements introduced in this branch of the industry of chemical products.

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**32. Imperial Berg Direction, Idria, Austria.**

## CHEMICALS.

*Report.*—Commended for the important and special preparation of oxides of uranium, salt of uranium, and vermilion in different states of purity.

## 33. Henry Bower, Philadelphia, Pa., U. S.

## CHEMICALS.

*Report.*—Careful crystallization and important manufacture of prussiate of potassium. Commended for the good quality of his prussiates, and sulphate of ammonium prepared from gas-liquor, and for the samples of pure glycerine exhibited.

## 34. J. G. Dreyfus &amp; Co., New York, N. Y., U. S.

## CREAM OF TARTAR.

*Report.*—The products exhibited consist of refined tartar, of the very first quality, prepared from the crude tartars imported from France and Italy.

## 35. Daniel H. Gray, New York, N. Y., U. S.

## REFINED SULPHUR.

*Report.*—Commended for the good preparation of refined sulphur in the form of roll, and flowers of sulphur.

## 36. Charles V. Mapes, New York, N. Y., U. S.

## SUPERPHOSPHATE AND RECTIFIED PERUVIAN GUANO.

*Report.*—Commended for the quality of compound fertilizer called "Nitrated Superphosphate;" for the preparation of rectified Peruvian guano, obtained by the action of sulphuric acid on guano. Experience has proved the superiority of guano submitted to this treatment.

## 37. Philadelphia Quartz Co., Philadelphia, Pa., U. S.

## SILICATES.

*Report.*—Commended for the manufacture of silicates of soda. The products exhibited, which contain but little soda, are uncolored and of good preparation.

## 38. Powers &amp; Weightman, Philadelphia, Pa., U. S.

## CHEMICALS.

*Report.*—Commended for the important and very extensive manufacture of mineral and organic salts, particularly for pharmacy. The principal productions which attracted the attention of the Judges were the salts of quinia, morphia, cinchonia, strychnia, the organic alkaloids, narcotine, brucia, caffeine, citric and tartaric acids, the salts of mercury and cadmium, and finally some blocks of alum, enabling them to judge of the importance of this manufacture.

## 39. Charles Dubois, Marseilles, France.

## SPECIAL CHEMICAL PREPARATIONS FOR THE NAVY.

*Report.*—Commended for the excellent quality of the preparations serving the purposes of the navy.

## 40. A. Boude &amp; Son, Marseilles, France.

## REFINED SULPHUR.

*Report.*—The products shown are of perfect purity.



## 41. H. J. Baker &amp; Brother, New York, N. Y., U. S.

## BORAX AND SALTPETRE.

*Report.*—Commended for crystallized borax, prepared from the crude borate of sodium from the deposits and borated waters of California; a new and important industry.

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## 42. Tacony Chemical Works (Ch. Lennig), Philadelphia, Pa., U. S.

## CHEMICALS.

*Report.*—Commended for the products exhibited coming from the distillation of wood, for metallic salts, and especially for careful manufacture of sulphate of alumina and alum. The Judges notice the crystalline mass of the latter product.

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## 43. Deligny Brothers, Lisbon, Portugal.

## CHEMICALS.

*Report.*—Commended for the manufacture of salts of soda and other inorganic salts, and for the beautiful samples exhibited.

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## 44. Serzedello &amp; Co., Lisbon, Portugal.

## CHEMICALS.

*Report.*—Commended for the manufacture of soda salts and other inorganic and organic products for scientific research, and for a fine collection of essential oils.

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## 45. Brückner, Lampe, &amp; Co., Leipsic, Germany.

## DRUGS.

*Report.*—Commended for their purity and cheapness.

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## 46. Brohme &amp; Co., Bergen-on-Dosse, Germany.

## RAW MATERIAL FOR THE MANUFACTURE OF SOLUBLE GLASS.

*Report.*—Commended for good quality and cheapness.

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## 47. State Paper Manufactory, St. Petersburg, Russia.

## PREPARATION OF OBJECTS BY GALVANOPLASTIC.

*Report.*—Commended for perfection in the preparation of electrotypes plates; ancient engravings perfectly reproduced; objects and electrotypes plates of different compositions, in iron, copper, nickel, and gold.

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## 48. J. F. Heyl &amp; Co., Berlin, Germany.

## CHEMICALS.

*Report.*—Commended for their careful preparation of sulpho-carbonate and xanthate of potassium.

These two products may be employed against the phylloxera and insects.

**49. Moritz Honigmann, Aix-la-Chapelle, Germany.**

## CHEMICAL PRODUCTS.

*Report.*—Commended on account of the endeavor, continued through many years and finally crowned with success, to improve and introduce the so-called ammonia process for the commercial production of soda.

---

**50. Rudolf Koepp & Co., Oestrich, Germany.**

## OXALIC ACID AND OXALATES.

*Report.*—Commended for oxalic acid and oxalates of great purity, manufactured by a new and improved process.

---

**51. Kunheim & Co., Berlin, Germany.**

## CHEMICALS.

*Report.*—Commended for an important exhibition of different products, perfectly prepared, especially phthalic acid, yellow of naphthaline, tungstate of soda, and salts of potassium.

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**52. Martin & Joseph Meens, Antwerp, Belgium.**

## REFINED SULPHUR.

*Report.*—Commended for the excellent quality of the roll sulphur and flowers of sulphur, produced on a large scale.

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**53. Solvay & Co., Coillet-lez-Charleroi, Belgium.**

## CHEMICALS.

*Report.*—The manufactory of Solvay & Co. is the first soda factory in Europe which produced soda by the so-called ammonia process. The soda shown is absolutely free from sulphur.

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**54. Muspratt Brothers & Huntley, Liverpool, England.**

## CHEMICALS.

*Report.*—This house exhibits first-class soda products, chlorate of potash, and refined sulphur extracted from the soda residues.

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**55. James Muspratt & Sons, Liverpool, England.**

## CHEMICALS.

*Report.*—This house exhibits first-class soda products, chlorate of potash, and refined sulphur extracted from the soda residues.

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**56. Prunier & Gilpin, American Chemical Works, Philadelphia, Pa., U. S.**

## CHEMICALS.

*Report.*—Commended for the good quality of the products shown, particularly for their picric acid and indigo preparations.

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**57. Greenbank Alkali Co., St. Helen's, Lancashire, England.**

## CHEMICALS.

*Report.*—Commended for their important exhibition of chemical products with soda base, especially for their caustic soda; also for the good quality of chlorate of potash.

**58. Peter Spence, Manchester, England.**

## CHEMICALS.

*Report.*—Commended for the excellent quality of the alum.

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**59. Richards, Kearne, & Gasquoine, Sandbach, Cheshire, England.**

## CHEMICALS.

*Report.*—Commended for the good quality of the soda salts prepared by the action of ammonia on the brine from rock-salt mines.

---

**60. Aseptin-Amykos Co. (Limited), by Dr. Fr. Söderlund, Upsala, Sweden.**

## ASEPTIN AND AMYKOS.

*Report.*—Commended for the advantages presented for the preservation of animal substances by the aseptic prepared by the exhibitor, and for the good quality of the toilet water called amykos.

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**61. Traugott Brunnschweiler, St. Gallen, Switzerland.**

## CHEMICAL PRODUCTS.

*Report.*—Commended for the excellent quality of the casein preparations, extremely important for the trade, viz., for the casein, free from fat, for calico printing, and the casein glue powder for kalsomining on wood, felt, and stone.

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**62. August Guyot-Lupold, Locle, Neuchâtel, Switzerland.**

## CHEMICAL PRODUCTS.

*Report.*—Commended for so-called artificially produced Swiss diamonds, serving for polishing steel, and for excellent bijouterie enamels.

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**63. Commissioners for Victoria, Melbourne, Victoria, Australia.**

## CHEMICALS.

*Report.*—Commended for good quality of chemical products chiefly used in pharmacy.

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**64. Government of Portugal, Lisbon, Portugal.**

## CHEMICAL MATERIALS AND PRODUCTS.

*Report.*—Commended for the exhibition of a highly interesting and important collection of chemical materials and products, derived from the Portuguese colonies, of which coloring lichens, copal, and vegetable oils especially deserve mention.

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**65. Chance Brothers & Co., Birmingham, England.**

## CHEMICAL PRODUCTS.

*Report.*—Commended for the good quality of commercial chemical products.

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**66. Gaskell, Deacon, & Co., Widness, Lancashire, England.**

## CHEMICALS.

*Report.*—Commended for salts of the very first class.

**67. Billings, Clapp, & Co., Boston, Mass., U. S.**

## CHEMICALS.

*Report.*—A very fine display of chemicals, such as bromide of potassium, bromide of ammonium, chromic acid, valerianic acid; especially carbolic acid, propylamin (trime-thylamine), chloride propylamin; and a very fine display of pharmaceutical chemicals, such as citrates of iron and quinia, citrates of iron and manganese, citrates of bismuth and ammonium, pyrophosphate of iron, and many others.

Commended for fine display and excellence of chemicals.

**68. Kurlbaum & Co., Philadelphia, Pa., U. S.**

## REFINED CAMPHOR AND CHEMICAL PREPARATIONS.

*Report.*—The exhibit consists principally of medicinal chemical preparations, especially salts of mercury, tartar emetic, butyric, acetic, and valerianic acids, compound ethers used as flavoring extracts, and refined camphor: all of excellent quality.

**69. Charles T. White & Co., New York, N. Y., U. S.**

## CHEMICAL AND PHARMACEUTICAL PREPARATIONS.

*Report.*—Commended for special purity of production and excellence of official character of pharmaceutical preparations. As especially worthy of note, chemically pure laboratory re-agents, the salts of the alkaloids, quinia, morphia, strychnia, and compounds of bromine, iodine, and the valerianates.

**70. Hood & Co., Melbourne, Victoria, Australia.**

## ESSENTIAL OILS AND CHEMICALS.

*Report.*—Commended for the good quality of essential oils distilled from native plants, and of chemical products used in pharmacy.

**71. William F. Simes & Sons, Philadelphia, Pa., U. S.**

## SUBLIMED AND COMPRESSED CAMPHOR.

*Report.*—Commended for excellent quality of sublimed and compressed camphor.

**72. A. d'Ailly & Sons, Amsterdam, Netherlands.**

## QUININE AND CINCHONINE.

*Report.*—Commended for the display, in large quantity and fine condition, of sulphate of quinine, sulphate of cinchonine, mixed cinchona, and alkaloids, the product of the cultivated cinchona plantations in Java, representing the success thus attained in artificially increasing the world's supply of these important substances.

**73. Vorster & Gruneberg, Kalk, near Cologne, Germany.**

## POTASH AND POTASH SALTS.

*Report.*—Commended for having first manufactured potash and potash salts, according to Leblanc's process, on a manufacturing scale, and for the purity of the products exhibited.

**74. Van der Elst & Matthes, Amsterdam, Netherlands.**

## SULPHATE OF AMMONIA.

*Report.*—Commended for the display of sulphate of ammonia of good quality and manufactured upon an important scale from gas-liquor.

**75. Guillermo Hay, Manager Guadalupe Soda Salt Works, City of Mexico, Mexico.**

**SALTS OF SODA.**

*Report.*—Commended for the production of handsomely purified and crystallized carbonate, sulphate, and chloride of sodium, from saline pools and saline earth of the valley of Mexico.

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**76. Bergen Gas Works, Bergen, Norway.**

**SULPHATE OF AMMONIUM.**

*Report.*—Commended for the display of sulphate of ammonium, both in the crude and refined state, produced from the gas-liquor of the Bergen works and utilized in the manufacture of fertilizers from Norwegian apatite.

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**77. Runcorn Soap and Alkali Co. (Limited), Liverpool, England.**

**BLEACHING POWDER AND SODA ASH.**

*Report.*—Commended for the extensive manufacture of commercial chemical products, especially bleaching powder and soda; and for the advantageous introduction of Hargreave's process for making the sulphate.

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**78. The Desoto Alkali Company (Limited), Widness, Lancashire, England.**

**CAUSTIC SODA.**

*Report.*—Commended for the good quality of caustic soda and other products of chemical industry.

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**79. Thomas Jennings, Cork, Ireland.**

**MAGNESIA PRODUCTS.**

*Report.*—Commended for the excellent quality of the carbonate of magnesia and calcined magnesia, partly manufactured by new methods.

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**80. The Newcastle Chemical Works Co. (Limited), Newcastle-on-Tyne, England.**

**SODA ASHES, ALKALI, AND BLEACHING POWDER.**

*Report.*—Commended for good and cheap products and for the introduction of the most recent apparatus and processes in the range of commercial chemical industry.

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**81. Pennsylvania Salt Manufacturing Co., Philadelphia, Pa., U. S.**

**CRYOLITE PRODUCTS, ALUM, ALUMINA, AND SODA.**

*Report.*—Commended for the superior purity of the caustic, carbonate, and bicarbonate of soda, and special freedom from iron of the alum and alumina sulphate, as well as completeness and magnitude of the exhibit of cryolite and its products.

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**82. John & James White, Shawfield Works, Glasgow, Scotland.**

**BICHROMATE OF POTASH.**

*Report.*—Commended for the production of bichromate of potash, of excellent quality.

**83. First Hungarian Wool Washing and Commission Co., Budapest, Austria, Hungary.**

**POTASH SALTS FROM "SUINT."**

*Report.*—Commended for the crude and refined snow-white carbonate of potassium, from the sweats of merino sheep, the so-called "suint," or sudorate of potassium, of excellent quality.

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**84. John Hutchinson & Co., Widness, Lancashire, England.**

**CHEMICALS.**

*Report.*—Commended for the remarkable exhibit of chemical products, among others roll sulphur, soda residues, caustic soda, soda crystals, and bicarbonate of soda.

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**85. Meade County Salt Works, Brandenburg, Meade County, Ky., U. S.**

**SALT.**

*Report.*—Commended for the exhibition of boiled salt, economically produced by the use, as fuel, of natural gas from the same wells that afford the brine.

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**86. Ohio River Salt Co., Pomeroy, Ohio, U. S.**

**SALT.**

*Report.*—Commended for the exhibition of coarse, fine, and dairy salt, of good quality, produced upon a very large scale, from natural brines of Ohio and West Virginia.

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**87. Thomas Higgin & Co., Liverpool, England.**

**SALT.**

*Report.*—Commended for excellent quality of dairy salt shown, of bright, fine grain, very pure, clean, and dry, the product of works in Cheshire, England.

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**88. International Salt Co., Goderich, Ontario, Canada.**

**SALT.**

*Report.*—The fishery and fine salt shown are both very clean, white, and dry, the product of Canadian salt wells.

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**89. Harrison & Evans, Goderich, Ontario, Canada.**

**SALT.**

*Report.*—Commended for the excellent exhibit of fishery salt, of very large grain, dry and well drained.

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**90. Gray, Young, & Sparling, Seaforth, Ontario, Canada.**

**SALT.**

*Report.*—Commended for the exhibition of dairy and table salt of excellent quality, with the natural brine from which these are made.

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**91. Tagus & Sado Lowlands Co., Lisbon, Portugal.**

**MARINE SALT.**

*Report.*—Commended for the very good quality of fine and crystallized salt.

92. **Baroneza de Samora Correa, Lisbon, Portugal.**

MARINE SALT.

*Report.*—Commended for the excellent quality of salt in crystals and powder.93. **Anna Delphina Branco, Alcacer do Sal, Portugal.**

MARINE SALT.

*Report.*—Commended for the excellent quality of salt in large white crystals.94. **João da Silva Ferrao, Castello Branco, Santa Iria, Portugal.**

MARINE SALT.

*Report.*—Commended for the variety of coarse and fine salt of excellent quality.95. **Viscount of Alcacer do Sal, Alcacer do Sal, Portugal.**

MARINE SALT.

*Report.*—Commended for very good crystals and fine white salt.96. **Cresswell & Co., Lisbon, Portugal.**

MARINE SALT.

*Report.*—Commended for fine quality of different grades of salt.97. **Aniceto Soriano, Jaen, Spain.**

SALT.

*Report.*—Commended for the exhibit of excellent salt, of coarse grain (fishing and packing), from sea-water; produced in large quantity.98. **Manuel de la Puente, Cadiz, Spain.**

SALT.

*Report.*—Commended for the excellent character of salt from sea-water, of medium grain, produced upon a very large scale.99. **José Leon Teruel, Huelva, Spain.**

SALT.

*Report.*—Commended for the fine character of large-grain (fishery) salt, from sea-water.100. **Eduardo Hidalgo & Berjano, San Lucas, Cadiz, Spain.**

SALT.

*Report.*—Commended for the good representation of salt from sea-water, from this well-known point of production, of very large grain and well drained.101. **Antonio J. Bensusan, Cadiz, Spain.**

SALT.

*Report.*—Commended for the exhibit of excellent salt, of medium grain, from sea-water.

**102. Onondaga Coarse Salt Association and American Dairy Salt Co., Syracuse, N. Y., U. S.**

SALT.

*Report.*—These companies exhibit together a full series of the different kinds of common salt which they produce: solar salt (packing, fishing, ordinary coarse, ground solar); boiled (anthracite); and fine salt (ordinary fine, dairy, and table). The very large scale of production and the excellence and high degree of purity (in part secured by chemical precipitation of deliquescent chlorides) of the salt turned out from these brine wells give more than usual importance to the exhibit.

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**103. John Corbett, Stoke Prior Salt Works, Worcestershire, England.**

REFINED WORCESTERSHIRE SALT.

*Report.*—Commended for the excellent quality of the refined salt, serving for household and agricultural purposes.

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**104. Direction of Public Works of the River Mondego and Figueira Bar, Coimbra, Portugal.**

MARINE SALT.

*Report.*—Commended for the excellent quality of fine and coarse white salt.

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**105. State of West Virginia, Wheeling, W. Va., U. S.**

SALT AND BROMINE FROM BRINE WELLS.

*Report.*—Commended for the exhibition of common salt and bromine, both of good quality, produced on a large scale from the natural brines of the State, and representing an important industrial development.

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**106. Bradley Fertilizer Co., Boston, Mass., U. S.**

COMMERCIAL FERTILIZERS.

*Report.*—Commended as the most complete and instructive exhibition of artificial fertilizers of superior quality, embracing the manufacture of various products from raw bone, viz., bone-black, roasted bones, ammoniacal liquor, sulphate of ammonium, and superphosphates; also the conversion of offal from slaughter-houses—viz., blood, entrails, meat, and bone—into very rich nitrogenous fertilizers; also the utilization of offal from the fisheries. Besides these, the firm manufacture largely most excellent manures from the South Carolina rock guano, using sulphuric acid of their own make.

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**107. Jarves & Hooper, Michigan Carbon Works, Detroit, Mich., U. S.**

ANIMAL CHARCOAL, FERTILIZERS, AND GLUE.

*Report.*—Commended for the excellent quality of bone-black and manures.

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**108. Rumford Chemical Works, Providence, R. I., U. S.**

ANIMAL CHARCOAL, MANURES, AND SOAP.

*Report.*—This exhibit consists of several grades of bone-black, largely used by the New York sugar refineries; Wilson's ammoniated superphosphate of lime, Wilson's Tobacco Grower, manures of excellent quality, and a very good article of common laundry soap.



**109. Augustin Silveyra, Buenos Ayres, Argentine Republic.****ARTIFICIAL MANURE.**

*Report.*—Commended for excellent manure produced from the putrefied offal of slaughter-houses.

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**110. Rocha & Co., Portuguese Fertilizer Manufactory, Belem, Lisbon, Portugal.****ANIMAL GUANO.**

*Report.*—Commended for the good quality of animal guano.

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**111. The Fertilizer Manufactory of Lisbon, Alcantara, Lisbon, Portugal.****ARTIFICIAL MANURES.**

*Report.*—Commended for the good quality of artificial manures prepared from bones, dried blood, flesh, and fish.

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**112. Josef Vishniakof & Sons, near Moscow, Russia.****MANURES.**

*Report.*—Commended for the excellent quality of products from bone and horn, viz., animal charcoal in several varieties, bone meal, horn meal, carbonate of ammonia, crude and pure, and superphosphate and ammoniated superphosphate of lime.

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**113. Calcined Bone Manufacturing Co., St. Petersburg, Russia.****MANURES.**

*Report.*—Commended for the exhibition of bone manure in different varieties, horn manure, phosphatic manure, bone manure with ten per cent. of sulphate of ammonia, and raw sulphate of ammonia, evidently of very good quality.

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**114. Francisco J. Tobella & Argila, Barcelona, Spain.****MANURES.**

*Report.*—Commended for the exhibit of numerous substances used in their manufacture of artificial manure, such as blood, dried blood, vegetable matter, bones, calcined bones, fish residues, and several brands of manure of more or less strength and prices.

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**115. Pedro Tapia & Pereira, Huelva, Spain.****FISH GUANO.**

*Report.*—The refuse from the large fisheries of tunny-fish are converted into an excellent quality of fish guano.

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**116. Stockholm Superphosphate Manufacturing Co., Stockholm, Sweden.****MANURES.**

*Report.*—Commended for the varieties of superphosphate of lime and ammoniated superphosphate, prepared both from French phosphates and Norwegian apatite, of excellent quality.

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**117. Farmers' Bone and Fertilizing Co., Philadelphia, Pa., U. S.****FERTILIZERS.**

*Report.*—Commended for the excellent quality of raw bone and nitro-phosphate manures.

## 118. W. Suhr, Altona, Germany.

## MANURES AND GLUE.

*Report.*—This establishment works up animal refuse, and converts it into marketable articles, producing excellent qualities of glue, grease, bone flour, dung flour, and superphosphates of lime.

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## 119. Bartels &amp; Koyemann, Frohse-on-the-Elbe, Germany.

## BONE DUST, SUPERPHOSPHATE, AND GLUE.

*Report.*—This factory is specially engaged in working up bones, and obtains therefrom glue of excellent quality, bone grease, bone flour, superphosphate of lime, and ammoniated superphosphates of superior quality.

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## 120. Bordewich &amp; Co., Lyngvær, Norway.

## FISH GUANO.

*Report.*—The exhibitor produces from fish the so-called fiskemel (Group IV.), and from the offal several varieties of excellent fish guano; also a fine quality of gelatine.

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## 121. Svend Foyn, Fönsberg, Norway.

## GUANO FROM WHALES.

*Report.*—Commended for the excellent guano made from dried bones and meat from whales; exhibits also stearine from whales.

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## 122. Norwegian Fish Guano Co., Christiania, Norway.

## FISH GUANO.

*Report.*—Commended for the excellent quality of fish guano.

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## 123. L. L. Crocker, Buffalo and New York, N. Y., U. S.

## SUPERPHOSPHATES AND FERTILIZERS.

*Report.*—Commended for the good quality of his superphosphates, and the fertilizers made from them by mixing with salts of ammonium and potassium ammoniacal liquor, dried flesh, and blood; for the intelligent determination of the manures intended for the different plants cultivated.

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## 124. Baugh &amp; Sons, Philadelphia, Pa., U. S.

## CHEMICAL FERTILIZERS, AND RAW MATERIAL FOR THE SAME.

*Report.*—Commended for the good quality of raw materials used in their manufacture, such as sulphuric acid, nitrate and sulphate of sodium, sulphate of ammonium, salts of potassium, bones entire and pulverized, and dried blood; for the good manufacture of different compound fertilizers.

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## 125. Lister Brothers, Newark, N. J., U. S.

## SUPERPHOSPHATES, ANIMAL CHARCOAL, BONES ENTIRE AND CRUSHED, AND HORN.

*Report.*—Commended for the quality of raw material used in the manufacture of artificial manures, such as bones whole and crushed, sulphuric acid, sulphate of ammonium, nitrate and sulphate of soda; for the quality of the superphosphates, of the animal charcoal, and of the bone manure.

## 126. Walton, Whann, &amp; Co., Wilmington, Del., U. S.

## FISH GUANO, BONE MEAL, AND SUPERPHOSPHATES.

*Report.*—Commended for the good manufacture and good determination of the different manures exhibited; for the importance given their industry.

## 127. A. W. Friestedt, Stockholm, Sweden.

## PREPARATIONS FROM BONE AND WOOD.

*Report.*—The exhibit consists of numerous preparations obtained by dry distillation of various woods, horn, and bones, etc., and the subsequent manufacture of the latter into manures, especially superphosphate and ammoniated superphosphate of lime.

## 128. Navassa Phosphate Co., New York and Baltimore, Md., U. S.

## FERTILIZERS.

*Report.*—Commended for the preparation of manures known under the names Patapsco Grange Mixture and Patapsco Tobacco Mixture, obtained by mixing this guano with ammoniacal salts; for the preparation of a fertilizer by treating the guano exhibited with sulphuric acid.

## 129. Midi Phosphate Co., Paris, France.

## NATURAL PHOSPHATES.

*Report.*—Commended for the good quality of natural phosphates, which are especially remarkable for their richness in tribasic phosphate and the small quantity of iron which they contain.

## 130. Alex. Cowan, Brockville, Ontario, Canada.

## SUPERPHOSPHATES AND MATERIALS FOR SUPERPHOSPHATES.

*Report.*—Commended for the excellent quality of the apatite, intended for the manufacture of superphosphate, and for the good manufacture of the latter.

## 131. Swift &amp; White, New York, N. Y., U. S.

## COMMERCIAL FERTILIZERS, SUPERPHOSPHATE OF LIME, GROUND BONE, DRIED GROUND MEAT, AND POUDRETTE.

*Report.*—Commended for the intelligent manufacture of valuable and high-grade fertilizers from the dead animals, offal, and bones, of the city of New York.

## 132. George E. White, New York, N. Y., U. S.

## SUPERPHOSPHATES, ANIMAL-BLACK, AND RAW MATERIAL FOR MANURES.

*Report.*—Commended for the excellence of the raw materials for manures, such as chloride of potassium, sulphate of ammonia, nitrate of soda, and bone meal; also fish guano, animal-black, and superphosphates.

## 133. John J. Juhler, Pomeroy Bromine Works, Pomeroy, Ohio, U. S.

## BROMINE.

*Report.*—Commended for the exhibition of good commercial bromine.

**134. Alvergniat Brothers, Paris, France.**

## CHEMICAL APPARATUS.

*Report.*—Commended for the excellent quality of chemical apparatus used in laboratories, and especially for fine display of Geissler's tubes.

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**135. Orsat, Paris, France.**

## CHEMICAL APPARATUS.

*Report.*—Commended for an improved apparatus for the commercial analysis of gases, whereby results of fair accuracy are obtained with ease and rapidity.

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**136. J. Bishop, Sugartown, Pa., U. S.**

## PLATINUM WARE FOR LABORATORY USE.

*Report.*—The exhibitor manufactures platinum vessels for laboratory use, from the native platinum, which he refines, or scraps. All articles are made from melted platinum, and hammered out. Commended for excellence in the quality of platinum apparatus.

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**137. E. B. Benjamin, New York, N. Y., U. S.**

## CHEMICALS AND CHEMICAL APPARATUS.

*Report.*—Commended for the excellence of design and finish of chemical apparatus for laboratory use, and for purity and rarity of the different chemicals exhibited.

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**138. Condit, Hanson, & Co., Newark, N. J., U. S.**

## ELECTRO-PLATING MATERIALS.

*Report.*—Commended for fine display of electro-plating materials, especially of nickel salts and metallic nickel.

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**139. Franz Batka, Prague, Bohemia, Austria.**

## CHEMICAL GLASS-WARE.

*Report.*—Commended for extraordinary perfection in the manufacture of chemical glass-ware, especially of retorts, beakers, combustion tubing, and bottles.

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**140. Tance & Kessler, Paris, France.**

## CHEMICAL APPARATUS.

*Report.*—Commended for an apparatus constructed by the exhibitor, and already excellently applied in practice for concentration of sulphuric acid on a large scale.

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**141. Lenoir & Forster, Vienna, Austria.**

## GLASS-WARE FOR LABORATORY USE, AND APPARATUS FOR PHYSICS AND CHEMISTRY.

*Report.*—Commended for good quality, elegance of construction, and strength.

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**142. J. H. Munktell (Grycksbo Factory), Grycksbo, near Falun, Sweden.**

## FILTERING PAPER.

*Report.*—This filtering paper is exhibited of three grades of thickness and porosity, and owes its value to two special conditions,—purity of water used, and command of low winter temperature to freeze the pulp and give the porous character required.

## 143. J. W. R. Schmecha, New York, N. Y., U. S.

## ROTATING STEAM COIL FOR EVAPORATION OF LIQUIDS.

*Report.*—Commended for simplicity and cheapness of construction, and adaptation to rapid evaporation of such liquids as are not liable to injury by free exposure to the atmosphere.

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## 144. Admiralty Galvanoplastic Works, Cronstadt, Russia.

## PREPARATIONS BY GALVANOPLASTIC.

*Report.*—Commended for very important preparation of different objects in copper, particularly of tubes, by galvanoplastic.

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## 145. F. A. Wolff &amp; Sons, Heilbronn, Germany.

## DISTILLING AND VAPOR APPARATUS FOR PHARMACEUTICAL AND CHEMICAL USE.

*Report.*—Commended for excellently constructed distillation apparatus for chemical and pharmaceutical laboratories.

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## 146. Gest &amp; Atkinson, Cincinnati, Ohio, U. S.

## ANIMAL, VEGETABLE, AND MINERAL OILS AND CANDLES.

*Report.*—Commended for excellency of manufacture and purity of products.

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## 147. United States of Venezuela.

## VEGETABLE AND ANIMAL OILS.

*Report.*—Commended for the exhibition of an interesting collection of South American oils, including amongst others turtle oil (*Peltocephalus Tracaya*) from the Orinoco, oil of *Pagurus granulatus*, crab oil (*Carapa guianensis*), and oil of *Jatropha (curcus)*.

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## 148. Provincial Board of Bulacan, Philippine Islands.

## VEGETABLE OILS.

*Report.*—The *ajonjoli* (*sesamum*) oil and *lumban* (*aleurites*) oil exhibited are very clear and brilliant, and represent the best qualities of these products.

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## 149. E. S. Morris &amp; Co., St. Paul's River, Liberia.

## VEGETABLE OIL.

*Report.*—Commended for the good quality of the palm-kernel oil exhibited, an oil of desirable character, but as yet little known or used in the United States.

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## 150. Widow Burnay, Lisbon, Portugal.

## VEGETABLE OILS.

*Report.*—Very limpid, and perfectly well made and pure; prices very cheap.

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## 151. De Jongh &amp; Schütten, Dordrecht, Netherlands.

## VEGETABLE OIL.

*Report.*—Commended for the exhibition of linseed and rape-seed oil of excellent quality, clear, bright, and free from albuminoid matter.

## 152. Fortuny Brothers, Barcelona, Spain.

## OIL OF SWEET ALMONDS.

*Report.*—Commended for fine exhibit of oil from Spanish almonds, pure, bland, and excellent in quality.

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## 153. Fray Nicolas Zugadi, Bulacan, Philippine Islands.

## VEGETABLE OILS.

*Report.*—The exhibitor sends specimens of several oils of very fine quality, of which those of the cocoanut and calophyllum (this latter used medicinally and for production of light) are particularly worthy of attention.

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## 154. Rita Osmeña &amp; Co., Cebú, Philippine Islands.

## COCOANUT OIL.

*Report.*—Commended for the very fine quality of cocoanut oil exhibited, comparing very favorably with many of the other specimens shown.

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## 155. Farmacia Monclova, San Juan, Porto Rico.

## VEGETABLE OILS.

*Report.*—Commended for the excellent quality of the oils of Porto Rico shown by this establishment, especially those of cocoanut, sweet almond, and sesamum.

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## 156. Alexander Poel, St. Petersburg, Russia.

## ROSEMARY OIL.

*Report.*—Commended for various oils and stearoptene obtained from *Ledum palustre*.

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## 157. Theodore Tzelikof, Moscow, Russia.

## VEGETABLE OILS.

*Report.*—Commended for the excellent quality of sunflower, mustard, rape, poppy, hemp, linseed, and nut oil.

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## 158. Frederico Steckel, Rio de Janeiro, Brazil.

## VEGETABLE OILS.

*Report.*—Commended for the exhibition of an interesting collection of vegetable oils, among which the oil of Andanaçu (*Joanesia princeps*) and fat oil of bitter almonds are worthy of special notice.

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## 159. Souza, Martins, &amp; Co., Pará, Brazil.

## VEGETABLE OIL.

*Report.*—Commended for the fine, clear character of oil of Pataua (*Oenocarpus sp.?*) exhibited, manufactured in quantity, and largely used in Brazil for alimentary purposes; also burned in lamps, and used for lubrication.

---

## 160. Ls. Vaucher, Peseux, near Neuchâtel, Switzerland.

## ANIMAL OIL FOR CHRONOMETERS AND FINE WATCHES.

*Report.*—Commended for the good quality of neat's-foot oil intended for chronometers and instruments of precision.

## 161. Charles Fitts &amp; Sons, Melbourne, Victoria, Australia.

## ANIMAL OILS.

*Report.*—Commended for the good quality of neat's-foot and trotter oil shown, manufactured on a considerable scale from residues of Australian meat preservation.

## 162. C. O. Werner &amp; Co., Stockholm, Sweden.

## CHRONOMETER OIL.

*Report.*—Commended for the good quality of the chronometer oil.

## 163. Amblet &amp; Poncet, Geneva, Switzerland.

## OILS FOR WATCHES AND FOR INSTRUMENTS OF PRECISION.

*Report.*—Commended for the good quality and cheapness of the oils for watches, chronometers, and instruments of precision.

## 164. Staes-Sproelants, Termonde, Belgium.

## LINSEED, HEMP-SEED, COTTON-SEED, AND COLZA OILS.

*Report.*—Commended for the careful manufacture and refinement of their oils; for the use of the refinement residues from the oils, in the manufacture of soft soap.

## 165. Koerper &amp; Co., Mannheim, Germany.

## MACHINE OILS, BOTTLING WAX, AND WAGON GREASE.

*Report.*—Commended for the excellence of the machine oils, bottling wax, machine grease, brown pitch, and shoemaker's pitch, and their moderate prices.

## 166. Jacques Pollak, Vienna, Austria.

## ETHEREAL OILS.

*Report.*—Commended for the excellent quality of the ethereal oils and essences.

## 167. D. Kruijsmulder, Amsterdam, Netherlands.

## COLZA OIL.

*Report.*—Commended for the excellent quality of refined colza oil, produced on an important scale.

## 168. M. H. Boyé &amp; G. T. Lewis, Philadelphia, Pa., U. S.

## COTTON-SEED OIL, MANUFACTURED AND REFINED.

*Report.*—The exhibit consists of crude and refined cotton-seed oils. The refined oil made in 1876 is perfectly tasteless, inodorous, and colorless, and can advantageously replace olive oil for many manufacturing and domestic purposes.

Award for excellence in refining cotton-seed oil.

## 169. C. Schmidt, Riga Cement and Oil Works, Riga, Russia.

## OILS.

*Report.*—Commended for the excellent quality of rape and linseed oils.

**170. New South Wales Shale and Oil Co., Sydney, New South Wales, Australia****COAL OIL.**

*Report.*—Commended for the good quality of kerosene oil distilled from native shale.

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**171. George Talheim, Riga, Russia.****SEALING WAX, AND WAGON GREASE.**

*Report.*—Commended for a very beautiful exhibit of sealing wax in great variety of quality and color; also wagon grease; all of superior quality.

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**172. Walker, Renwicks, & Co., Auckland, New Zealand.****KAURI GUM.**

*Report.*—Commended for excellence of display of different qualities of Kauri gum, including some of exceptional merit.

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**173. Prof. Schorlemmer, Owens College, Manchester, England.****HYDRO-CARBONS AND THEIR COMPOUNDS.**

*Report.*—Commended as showing for the first time that the products exhibited existed ready-formed in the natural petroleum, they having previously been found only in the distillates from coal. All the compounds are chemically pure; and, while only in small quantity, still the fact of their existence is important to science, and may in the future prove of vast practical benefit. We consider the exhibit a very unique one.

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**174. Caleb Cook, Provincetown, Mass., U. S.****WATCH AND CLOCK OIL.**

*Report.*—Commended for the excellent quality of the oil which he manufactures from the mellow on the head of the blackfish.

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**175. George J. Faller, Philadelphia, Pa., U. S.****SEWING-MACHINE OIL.**

*Report.*—Commended for the excellent quality of sewing-machine oil.

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**176. Frazer Lubricator Co., New York, N. Y., U. S.****AXLE GREASE.**

*Report.*—Commended as an axle grease of good quality.

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**177. Hyde Brothers & Swift, New York, N. Y., U. S.****FISH OILS FOR TANNERS' USE.**

*Report.*—This house exhibits a very full collection of tanners' oils made or refined by them, among which cod-liver oil, cod oil, straits and bank oil (from the menhaden fish), blackfish oil, sperm, whale, and seal oil, and neat's-foot oil, may be especially mentioned, all of good quality; the refined cod-liver, blackfish, and neat's-foot oil, particularly pure and bright; tanners' extracts are also shown



**178. Ezra Kelley, New Bedford, Mass., U. S.**

## WATCH AND CLOCK OIL.

*Report.*—Commended for the oil he exhibits, which is made with the utmost care from the head of the blackfish.

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**179. Warden & Oxnard, Pittsburg, Pa., U. S.**

## REFINED PETROLEUM.

*Report.*—The refined petroleum ("Elaine oil") exhibited is beautifully bright, clear, and colorless, and its "flash point" is a good deal higher than that of most oils commonly to be found in the market.

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**180. Wm. F. Nye, New Bedford, Mass., U. S.**

## WATCH, CLOCK, AND SEWING-MACHINE OIL.

*Report.*—The exhibitor presents watch and clock oil from different parts of the head of the blackfish and porpoise, and sewing-machine sperm oil, which are very bright, clear, and limpid, and withstand quite a low temperature without thickening. The crude oils used are brought directly into the port of New Bedford.

---

**181. W. King, Son, & Co., Philadelphia, Pa., U. S.**

## PETROLEUM OILS.

*Report.*—The gasolines, benzines, and burning oils are all well purified, and the latter show a varying fire-test from 110° to 180° F.

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**182. E. F. Houghton & Co., Philadelphia, Pa., U. S.**

## LUBRICATING OILS FROM PETROLEUM.

*Report.*—The lubricating oils are of excellent quality.

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**183. Charles Pratt & Co., New York, N. Y., U. S.**

## PETROLEUM PRODUCTS.

*Report.*—The astral oil was one of the first high test oils offered to the public. The mineral colza is a very pure and very high test oil (300° F.). The benzines, naphthas, and gasoline are thoroughly purified. The rhigolene and chymogene are the only examples of the lightest petroleum products exhibited.

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**184. N. W. Harkness, Philadelphia, Pa., U. S.**

## REFINED PETROLEUM.

*Report.*—Commended for high fire-test of the burning oil, and purity of all the products.

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**185. Charles K. Smith & Co., Philadelphia, Pa., U. S.**

## WHALE AND MINERAL OILS.

*Report.*—Commended for great variety and excellent quality of the oils exhibited.

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**186. C. West & Sons, Baltimore, Md., U. S.**

## REFINED PETROLEUM.

*Report.*—Commended for excellence of manufacture and high test of refined petroleum burning oil.

**187. Oleophene Oil Co., New York, N. Y., U. S.****REFINED PETROLEUM.**

*Report.*—Commended for excellence of manufacture and high fire-test of refined petroleum burning oil.

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**188. Chesebrough Manufacturing Co., New York, N. Y., U. S.****VASELINE, OR PETROLEUM JELLY.**

*Report.*—Commended for novelty, great value in pharmacy, unequaled purity, and superiority of manufacture.

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**189. Aladdin Lubricating Oil Works, Pittsburg, Pa., U. S.****PETROLEUM PRODUCTS.**

*Report.*—The paraffin is thoroughly purified and of excellent quality. The lubricating oils are very pure, and adapted to all kinds of machinery.

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**190. Chard & Howe, New York, N. Y., U. S.****LUBRICANT.**

*Report.*—Commended for superior quality of lubricating compound.

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**191. Galena Oil Works (Limited), Franklin, Pa., U. S.****LUBRICATING AND BURNING OILS FROM PETROLEUM AND MODEL OIL FARM.**

*Report.*—Commended for purity and high test of burning oils, excellence of lubricating oils, special superiority of dark petroleum lubricating oil, and interesting exhibit of an oil farm.

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**192. Leonard & Ellis, New York, N. Y., U. S.****VALVOLINE CYLINDER OIL.**

*Report.*—Commended for purity, high fire-test, and excellent body of this lubricating oil.

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**193. Crew, Moore, & Levick, Philadelphia, Pa., U. S.****ILLUMINATING AND LUBRICATING OILS.**

*Report.*—Commended for the excellence of manufacture and superiority of product.

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**194. F. S. Pease, Buffalo, N. Y., U. S.****LUBRICATING AND IMPROVED ENGINE AND MACHINERY OILS.**

*Report.*—The improved engine and machinery oil, the compound coach oil for railroads, and the extra and refined lard oils of this exhibit are of the highest order of manufacture, and the best submitted.

---

**195. F. S. Pease, Buffalo, N. Y., U. S.****OILS AND PRODUCTS.**

*Report.*—This exhibit possesses a special interest and importance, showing great progress in the production of refined burning oils and first-class lubricators. As an educational exhibit, showing complete series of animal, vegetable, and mineral oils, and products, it is valuable and instructive.

## 196. F. S. Pease, Buffalo, N. Y., U. S.

## REFINED PETROLEUM AND ILLUMINATING OILS.

*Report.*—The oils exhibited show the highest fire-test, combined with superiority of color and purity.

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## 197. Cook &amp; Pulver, Albany Lubricating Co., Albany, N. Y., U. S.

## LUBRICANT.

*Report.*—Commended for excellent quality of lubricating compound.

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## 198. W. P. Miller &amp; Co., New York, N. Y., U. S.

## LUBRICANTS.

*Report.*—The Boedecker lubricants and grease for railroad cars and rolling mills have been tested in comparison with winter sperm oil, pure lard oil, and pure olive oil, at the United States Navy Yard in Brooklyn, and were found to be of superior quality.

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## 199. John Chr. Bloedners &amp; Son, Gotha, Germany.

## SOAPS AND IMITATIONS OF FRUITS IN SOAP.

*Report.*—Commended for the quality of his soaps and his beautiful imitations of fruits in soap.

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## 200. Franz Prochaska, Prague, Austria.

## SOAPS, PERFUMES, AND POMADES.

*Report.*—Commended for the good quality of his perfumes and soaps.

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## 201. Alexis Joukof, St. Petersburg, Russia.

## MARBLED AND WHITE SOAPS FOR DOMESTIC USE.

*Report.*—Commended for the excellent quality, good manufacture, and cheapness of his soaps with a base of fat and of cocoanut oil.

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## 202. J. C. &amp; J. Field, London, England.

## CANDLES, TOILET SOAPS, BEESWAX, AND REFINED YELLOW WAX.

*Report.*—Commended for the superior quality of the products, for the improvements introduced in the candle industry, and especially the introduction of ozokerite.

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## 203. A. &amp; F. Pears, London, England.

## TRANSPARENT TOILET SOAP.

*Report.*—Commended for the excellent quality of the soaps, and for the invention of transparent soap.

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## 204. George D. Morse &amp; Co., Toronto, Ontario, Canada.

## SOAPS AND CANDLES.

*Report.*—Commended for the quality of the soaps, for the excellent manufacture of tallow candles in imitation of stearine candles.

## 205. Albert Toilet Soap Co., Montreal, Canada.

## TOILET SOAPS, OILS, AND COMMON SOAPS.

*Report.*—Commended for the quality of their soaps and of the oil used in their manufacture; for the importance given their manufacture.

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## 206. A. W. Hood &amp; Son, Montreal, Canada.

## SOAPS.

*Report.*—Commended for the quality of their toilet and common soaps.

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## 207. Thomas Worsley &amp; Co., Philadelphia, Pa., U. S.

## TOILET, FANCY, AND SHAVING SOAPS.

*Report.*—Commended for the quality of their toilet soaps and common soaps.

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## 208. James B. Williams &amp; Co., Glastonbury, Conn., U. S.

## SHAVING AND TOILET SOAPS.

*Report.*—Commended for superior quality of shaving soaps, not excelled by any other exhibited.

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## 209. Anton Säuberlich, Zwickau, Germany.

## SOAPS AND IMITATIONS OF FRUITS IN SOAP.

*Report.*—Commended for the good quality of his toilet soaps and the beautiful imitation of fruits in soap.

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## 210. Des Cressonnière's Widow &amp; Son, Molenbeek St. Jean, near Brussels, Belgium.

## TOILET SOAPS.

*Report.*—Commended for the excellent quality and cheapness of their products.

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## 211. Sanders &amp; Co., Leyden, Netherlands.

## SOAPS.

*Report.*—Commended for good quality of the toilet soaps and the cheap soaps.

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## 212. I. L. Cragin &amp; Co., Philadelphia, Pa., U. S.

## DOBBINS' ELECTRIC SOAP.

*Report.*—Commended for excellence of manufacture.

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## 213. Charles Roux Son, Marseilles, France.

## SOAP AND RAW MATERIAL.

*Report.*—Commended for the excellent quality of soap, called Marseilles, manufactured by this house.

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## 214. E. Conti &amp; Sons, Leghorn, Italy.

## SOAPS.

*Report.*—Commended for the good quality and cheapness of the soaps.

**215. Chioggia & Turchi, Pontelagoscuro, Italy.**

## SOAPS.

*Report.*—Commended for the good quality of the toilet soaps and of the transparent glycerine soap.

---

**216. William Dreydoppel, Philadelphia, Pa., U. S.**

## SOAP.

*Report.*—The addition of borax to a good hard tallow soap produces an excellent material for laundry use. The borax soap shown appears to be well made, and well adapted to the purpose for which it is intended.

---

**217. McKeone, Van Haagen, & Co., Philadelphia, Pa., U. S.**

## SOAPS.

*Report.*—The exhibitors make a grand display of different kinds of soaps of superior quality, obtained by a complete saponification of animal and vegetable fats and oils. There are not only the finest quality of toilet soaps, but also very excellent laundry soaps, and especially soaps adapted to various manufacturing purposes, as for silk and woolen manufacturers, dyers, and calico printers. Their castile soap, made from pure olive oil, is equal to the best imported. Commended for grand display, great variety, and superiority of toilet, laundry, and manufacturers' soaps.

---

**218. Enoch Morgan's Sons, New York, N. Y., U. S.**

## SAPOLIO SOAP.

*Report.*—Commended for the introduction of a new and cheap detergent applicable with hot, cold, soft, hard, or sea water.

---

**219. Henry Tetlow & Brother, Philadelphia, Pa., U. S.**

## FINE TOILET PREPARATIONS, SOAPS, AND PERFUMERY.

*Report.*—Commended for the good quality of their toilet preparations, especially their blanc, illusion, and new mill soaps.

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**220. Agostinho Freire da Silva & Co., Lisbon, Portugal.**

## SOAP.

*Report.*—Commended for the good quality of olive oil, tallow, turpentine, and toilet soap exhibited, produced upon a large scale.

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**221. José Antonio Gasáu, Seville, Spain.**

## SOAP.

*Report.*—Commended for the display of hard olive oil soap of four different grades, all of good quality; the highest grade excellent.

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**222. José Benito Saenz Martinez, Malaga, Spain.**

## SOAP AND CANDLES.

*Report.*—Commended for the exhibition of brown olive oil soap, made at a low price, and of good stearine candles.

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223. Moneo & Mirat, Salamanca, Spain.

SOAP.

*Report.*—Commended for the good character of hard mottled soap made from olive oil and barilla of Alicante, with specimens of these materials used.

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## 224. Yarritu's Sons, Madrid, Spain.

SOAP.

*Report.*—Commended for the exhibition of a fine collection of white and mottled (olive oil and soda) soap, firm, dry, and well manufactured.

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## 225. Carlos Astolfi y Mainero, Seville, Spain.

SOAP.

*Report.*—Commended for the useful character of coarse olive oil soap shown. This soap is largely produced at a low price, and sent abroad, chiefly to France, to be refined by perfumers and manufacturers of toilet soaps.

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## 226. William Conway, Philadelphia, Pa., U. S.

SOAP.

*Report.*—The laundry soaps shown, in particular that made from the oleic acid of candle manufacture, are of good quality, and give satisfactory results in use.

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## 227. Pietro Calamari, Milan, Italy.

SOAP.

*Report.*—Commended for the good quality of olive oil soap, green and white.

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## 228. Agostino Oneto &amp; Co., Sanpierdarena, near Genoa, Italy.

SOAP.

*Report.*—Commended for the excellent quality of hard olive oil soap exhibited, white, green, and mottled.

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## 229. Ignaz Weineck, Stockerau, Austria.

SOAPS AND PERFUMERY.

*Report.*—Commended for the careful preparation and moderate price of washing and toilet soaps.

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## 230. Carlo Sell, Pirano, Austria.

SOAPS.

*Report.*—Commended for the excellent quality of soaps prepared from hazel-nut oil.

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## 231. Robinson Brothers &amp; Co., Boston, Mass., U. S.

TOILET SOAPS.

*Report.*—Commended for the excellent quality of toilet soaps.

## 232. C. R. Taylor &amp; Co., Philadelphia, Pa., U. S.

SOAPS, POMADES, AND PERFUMES.

*Report.*—Commended for the excellent quality of the articles of perfumery.

## 233. L. P. Holmblad, Copenhagen, Denmark.

STEARINE CANDLES.

*Report.*—Commended for good quality and cheapness of the candles, and the importance given to the manufacture of stearine products.

## 234. Reali Giuseppe &amp; Erede Gavazzi, Venice, Italy.

WAX CANDLES.

*Report.*—Commended for superior quality.

## 235. Lanza Brothers, Turin, Italy.

STEARINE CANDLES.

*Report.*—Commended for the excellent quality of stearine candles.

## 236. Paul Dobel, Boryslaw, Austria.

OZOKERITE, CRUDE AND REFINED, AND OZOKERITE CANDLES.

*Report.*—Commended for the excellent quality of white ozokerite manufactured from the ozokerite of Galicia; for excellence of manufacture of candles from ozokerite.

## 237. F. A. Sarg's Son &amp; Co., Liesing, near Vienna, Austria.

OZOKERITE, STEARINE, SOAPS, AND GLYCERINE.

*Report.*—Commended for the excellent quality of their ozokerite and other products; for their perfected manufacture of stearic acid and glycerine.

## 238. Gustav Wagenmann, Vienna, Austria.

OZOKERITE AND OZOKERITE CANDLES.

*Report.*—Commended for the excellence of the products, and for the progress which the exhibitor has caused in the industry of ozokerite.

## 239. Dr. B. Hübner, Rehmsdorf, Germany.

PARAFFINE FROM LIGNITE, AND PARAFFINE CANDLES.

*Report.*—Commended for the excellent quality of the products.

## 240. Krestovnikof Brothers, Kazan, Russia.

STEARINE AND TALLOW CANDLES.

*Report.*—Commended for the excellent quality and careful manufacture of stearine candles and glycerine.

## 241. Price's Patent Candle Co. (Limited), Belmont Works, Battersea, London, England.

FATTY ACIDS, CANDLES, GLYCERINE, PARAFFINE, AND TAPERS.

*Report.*—Commended for the quality and cheapness of the products.

## 242. Imperial Stearic Light Co., Rio de Janeiro, Brazil.

## STEARINE CANDLES AND OLEINE SOAPS.

*Report.*—Commended for the excellent quality of the stearine candles.

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## 243. Ferreira de Carvalho &amp; Brother, Brazil.

## STEARINE CANDLES.

*Report.*—Commended for the excellent quality of the stearine candles manufactured by this firm, and for the cheapness of the goods; for the importance given to their manufacture in a country where the industry is little developed.

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## 244. Liljeholmens Stearine Manufacturing Co., Stockholm, Sweden.

## STEARINE CANDLES, GLYCERINE, AND OLEINE.

*Report.*—Commended for the good quality of the products, and for the importance given the manufacture of stearine products.

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## 245. M. Liger, Puebla, Mexico.

## CANDLES.

*Report.*—Commended for the good quality of hard stearine candles, manufactured upon a scale of commercial importance.

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## 246. Riza Effendi, Constantinople, Turkey.

## CANDLES.

*Report.*—Commended for the handsome character of highly ornamented wax candles for use in connection with marriages and religious ceremonies.

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## 247. Hartmann, Laist, &amp; Co., Cincinnati, Ohio, U. S.

## GLYCERINE.

*Report.*—Commended for glycerine of great brilliancy, purity, and cheapness.

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## 248. Wm. J. M. Gordon, Cincinnati, Ohio, U. S.

## GLYCERINE.

*Report.*—Commended for purity in quality, elegance of appearance, and high specific gravity of glycerine.

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## 249. Apollo Stearine Candle Co., Melbourne, Victoria, Australia.

## CANDLES.

*Report.*—Commended for the exhibition of stearine candles and crude paraffine from shale; for good quality of candles, and for the initiation of an industry new to Australia in making paraffine from the shale of that country.

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## 250. Waterman Brothers, London, Ontario, Canada.

## PARAFFINE.

*Report.*—Commended for the general excellence and scale of manufacture from Canadian raw petroleum of a series of petroleum products, including so-called benzine, head-light, and other burning oils, lubricating oils of different kinds, paraffine and paraffine candles,—all of superior quality.



**251. Antonio Jose Texeira Mello, Lisbon, Portugal.****CANDLES.**

*Report.*—Commended for the exhibition of a fine assortment of plain and elaborately ornamented wax candles for church use; of excellent workmanship.

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**252. Jose Salvado, Barcelona, Spain.****CANDLES.**

*Report.*—Commended for the extensive and excellent display of wax and stearine candles, plain, and highly ornamented for church use. Among the articles of special interest are wax candles bleached to unusual whiteness, and stearine candles with longitudinal tubulures running through them to prevent guttering outside when held in a draught of air.

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**253. Saxon-Thuringian Co. for the Utilization of Lignite, Halle-on-the Saale, Germany.****PARAFFINE, CANDLES OF PARAFFINE, AND LIGNITE.**

*Report.*—Commended for the excellent quality of the products exhibited, and for the improvements introduced in the industry of lignite distillation.

---

**254. Robertson & Co., Botany, New South Wales.****STEARINE CANDLES.**

*Report.*—Commended for the good quality of the candles manufactured in a country where the industry is still but little developed; for the importance given the manufacture of stearine products.

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**255. Kitchen & Sons, Melbourne, Victoria, Australia.****STEARINE, AND CANDLES MANUFACTURED OF STEARINE.**

*Report.*—Commended for the good quality of candles manufactured of stearine from pressed tallow; and for the importance given the manufacture.

---

**256. Deleuil, Paris, France.****PHOTOMETRIC APPARATUS FOR ILLUMINATING GAS.**

*Report.*—Commended for the superiority of his photometric apparatus. This apparatus, constructed on the principles of Messrs. Dumas & Regnault, may be considered one of the most perfect in existence for measuring the illuminating power of illuminating gas.

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**257. Reinhold Wünschmann, Leipsic, Germany.****CANDLE-MAKING MACHINE.**

*Report.*—Commended for excellence in design, arrangement, and construction, originality in details, and fitness to the purpose intended.

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**258. Beyer Brothers, Paris, France.****SOAP AND CHOCOLATE MACHINE.**

*Report.*—Commended for the invention and perfect construction of improved apparatus serving for the manufacture of aromatic soaps and of chocolate.

## 259. The Mains Manufacturing Co., New York, N. Y., U. S.

## THE PHILOSOPHER'S OIL TESTER.

*Report.*—Commended for its accuracy, convenience, and safety.

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## 260. Morane, Jr., Paris, France.

## MACHINES FOR STEARINE.

*Report.*—Commended for his machines to be used in the stearine industry, especially a washing and a polishing apparatus and hydraulic hot press of perfect construction.

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## 261. Devoe Manufacturing Co., New York, N. Y., U. S.

## BRILLIANT OIL AND OIL-CAN TOPS.

*Report.*—Commended for excellent quality of high-test oil, and very ingenious and useful oil-can tops.

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## 262. Emile Van Haecht, Haeren, Belgium.

## MODELS OF WORKS FOR WORKING UP FAT RESIDUES.

*Report.*—Model of an ingenious and useful apparatus for working up and utilizing fatty residues with the use of carbon bisulphide. The samples of oleine and stearine produced by this process bear witness to the excellence of this method of extraction.

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## 263. Robert Freeland, Toronto, Ontario, Canada.

## MACHINE FOR BOILING SOAP UNDER PRESSURE.

*Report.*—Commended for the convenient arrangement and adaptation to intended use of small machine (working model) shown. The features most worthy of notice are the division of the vertical cylinder, to contain the grease and alkaline lye, into two portions by a loose internal (vertical) cylinder, in the centre of which is the coil of steam-pipe for heating, ascending and descending currents being thus produced, which dispense with mechanical arrangements for stirring, and the arrangement of cocks for filling and emptying under pressure. The machine may also be used in the preparation of pharmaceutical extracts.

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## 264. John W. Jarboe, New York, N. Y., U. S.

## JARBOE'S DIAMOND ENAMEL PAINT.

*Report.*—Commended for excellence of paint for iron to prevent the action of the atmosphere, water, and acids; especially suited for sugar moulds and tanks.

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## 265. Henry M. Johnston, New York, N. Y., U. S.

## KALSOMINE AND FRESCO PAINTS.

*Report.*—Commended in that these paints are well prepared, and that the glue is ground up in impalpable powder with the colors and the base, and the admixture of about two per cent. of carbolic acid keeps the solution of the colors from becoming putrescent for a considerable time after mixing with water.

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## 266. Kreider, Campbell, &amp; Co., Philadelphia, Pa., U. S.

## PAINT MILL.

*Report.*—Commended for simplicity and excellence in the construction of paint mill.

## 267. Seeley &amp; Stevens, New York, N. Y., U. S.

## PELLUCIDITE.

*Report.*—The pellucidite, or architectural wood finish, is a superior article for finishing hard wood and giving it a brilliant lustre.

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## 268. John W. Tully, Philadelphia, Pa., U. S.

## • FILLERS FOR IRON AND WOOD.

*Report.*—Commended for superior composition for filling the grain of hard or fancy woods and iron, and finishing steel color paint.

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## 269. C. T. Reynolds &amp; Co., New York, N. Y., U. S.

## COLORS.

*Report.*—Commended for the very fine samples of colors for painting in general, and particularly for carriage-makers; good quality of varnishes. The cobalt blues, the chrome greens and yellows, the carmines, and the colors for the preparation of artificial flowers, are particularly good.

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## 270. Wetherill &amp; Brother, Philadelphia, Pa., U. S.

## LEAD COLORS.

*Report.*—Commended for the excellent quality of the goods exhibited. This exhibit shows excellent quality of white lead manufactured by the Dutch process, buckles of lead as used in the works, and corroded buckles, and litharge, orange-mineral, and red lead.

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## 271. Zindgraf &amp; Hohenadel, Philadelphia, Pa., U. S.

## PAINT MILL AND MIXER COMBINED.

*Report.*—Commended for excellence and simplicity in the construction of paint mill and mixer.

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## 272. Alexander Borthwick, Melbourne, Victoria, Australia.

## PAINTS AND VARNISHES.

*Report.*—Commended for the excellence of quality of varnishes, anti-corrosive paints, and anti-fouling composition for ships' bottoms.

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## 273. Buchanan Mineral Co., Walsingham, Ontario, Canada.

## MINERAL PAINT.

*Report.*—Commended for the superior quality and variety of shades of mineral paint.

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## 274. Gustavus von Kramsta, Sosnowce, Pietrokov, Russia.

## ZINC WHITE.

*Report.*—Commended for four grades of zinc white of excellent quality.

---

## 275. Nikita Wolf, Sokolovo, Tver, Russia.

## MINERAL PAINTS.

*Report.*—Commended for very superior quality of mineral paint of numerous shades of gray and brown, for wall paper, and especially for covering iron roofs and wood.

**276. Waggoner, Gifford, & Co., Chicago, Ill., U. S.****MIXED PAINTS.**

*Report.*—Commended for superior quality of mixed paints; they are ready for use, easily applied, dry rapidly, and have a beautiful glossy finish.

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**277. Franz Paul Herbert, Klagenfurt, Austria.****WHITE LEAD.**

*Report.*—Commended for white leads of good quality, known as fine Holland, fine Venetian, and fine Hamburg.

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**278. Lymans, Clare, & Co., Montreal, Canada.****PIGMENTS AND OILS.**

*Report.*—Commended for excellence of quality of Canada balsam, linseed oil, and ground colors, as used by painters.

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**279. T. Ramsay, Montreal, Canada.****PIGMENT.**

*Report.*—Commended for the production of a new white pigment of great body and not liable to blacken.

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**280. A. Ramsey & Son, Montreal, Canada.****PAINTS.**

*Report.*—Commended for the good quality of ground paints exhibited.

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**281. Averill Chemical Paint Co., New York, N. Y., U. S.****READY PREPARED PAINTS.**

*Report.*—This paint presents an entirely different composition from other paints in general use, and the work which has been done with it, some of it exposed for years to the moist atmosphere of a sea-shore, proves its great durability. It is mixed ready for use, easily applied, of great beauty, and economical.

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**282. John Jewett & Sons, New York, N. Y., U. S.****WHITE LEAD.**

*Report.*—Commended for white lead, dry and in oil, and raw, boiled, and refined linseed oil. The white lead is prepared by the so-called Dutch process, and of excellent quality.

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**283. Brooklyn White Lead Co., New York, N. Y., U. S.****LEAD COLORS.**

*Report.*—This company exhibits lead buckles, corroded lead buckles, dark litharge for india-rubber manufacturers, light litharge for potters' use, and flake litharge of very fine quality; also white lead of excellent color and body, and red lead of very fine color. Commended for the excellent quality of the goods exhibited.

**284. The United States Fertilizing and Chemical Co., Philadelphia, Pa., U. S.**

SUPERPHOSPHATES OF FOSSIL BONES, COMPOUND FERTILIZERS, SALTS FOR FERTILIZING, AND PHOSPHORIC ACID.

*Report.*—Commended for their excellent manufacture of superphosphate of lime from the fossil bone (*phosphatic nodules*) of South Carolina; also for the superior quality of phosphate of soda, phosphate of ammonia, crystallized phosphate of potash, acid phosphate of lime (national patent improved tartar), and of phosphoric acid.

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**285. John Lucas & Co., Philadelphia, Pa., U. S.**

COLORS AND PAINTS.

*Report.*—Commended for the superiority and beauty of exhibit, and especially for very superior Swiss and Imperial French green colors entirely free from arsenic; various shades of chrome yellows, soluble and Prussian blues, and an excellent quality of permanent white (zinc white).

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**286. John T. Lewis & Brothers, Philadelphia, Pa., U. S.**

COLORS AND PAINTS, ACETIC ACID, AND OILS.

*Report.*—Commended for the excellent quality and great variety of the exhibit, which comprises a variety of colors and paints, mostly made from lead, together with the materials used in the manufacture, such as acetic acid of their own make, and, for illustration, partly and completely corroded buckles. Their white lead, produced by the Dutch process, is of great whiteness, good body, and very fine quality. For comparison are exhibited samples of white lead prepared from the various qualities of lead in the market; also a very interesting sample of so-called sublimated white lead, obtained by the combined action of heat and a strong blast of atmospheric air upon the natural sulphide of lead, or galena. Besides the white leads are exhibited litharge, red lead, orange-mineral, several shades of chrome yellow, chrome green, Chinese blue, and soluble blue.

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**287. Harry Erwin & Co., Bethlehem, Pa., U. S.**

MINERAL PAINTS.

*Report.*—Commended for the excellent quality of raw and burnt umbers, siennas, brown and black paints.

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**288. E. B. Estes & Son, New York, N. Y., U. S.**

SIGN-PAINTERS' SMALTS.

*Report.*—Commended for the great variety, brilliancy, and durability of sign-painters' smalts.

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**289. Thomas Brothers, Avignon, Vaucluse, France.**

DYES.

*Report.*—Commended for the superior quality of natural madder products, and of artificially-prepared alizarine, together with intermediate products of its manufacture.

**290. Daughter and Successor of Ramon Monroig, Barcelona, Spain.**

DYE-STUFFS.

*Report.*—Commended for the excellence of character and condition of garancine, pincosfine, and syrupy extracts of dyewoods.

**291. Th. Wurtz's Successor, Leipsic, Germany.**

DYE-STUFFS.

*Report.*—Commended for the variety and excellent quality of the different lakes and archil preparations exhibited.

**292. The Tiel Garancine and Madder Manufactory, Tiel, Netherlands.**

GARANCINE.

*Report.*—Commended for the especial excellence of garancines and madder products.

**293. M. B. Vogel, Leipsic, Germany.**

COLORS FOR DYEING.

*Report.*—Commended for the colors, of especial purity and beauty of tint, produced by this manufactory.

**294. Imperial Board of Industry, Agriculture, & Commerce, Tokio, Japan.**

DYE-STUFFS, RAW AND PREPARED LACQUERS, AND SUGAR.

*Report.*—Commended for the display of sundry dyeing materials of Japanese origin, including, amongst those partially treated by artificial processes, a peculiar form of indigo; also for the very interesting character of the collection shown of lacquer varnish in its crude state and prepared for use, with the accessory substances used; also for the interesting character of a collection of raw Japanese sugars, and confections made therewith.

**295. C. J. Gilkinet, Ensival, Belgium.**

SPECIAL INK, TO POINT OUT THE DEFECTS ON CLOTH AND DYE-STUFFS.

*Report.*—Commended for the service rendered the woollen industry by the discovery of his composition intended for pointing out defects in coloring on tissues, called "cache epoutil."

**296. Charles Moser & Co., Cincinnati, Ohio, U. S.**

COLORS AND LAKES.

*Report.*—Commended for the great variety and beauty of colors and lakes; also artists' oil colors.

**297. L. Durand & Huguenin, Basle, Switzerland.**

COAL-TAR COLORS.

*Report.*—Commended, for the fineness of display of coal-tar colors, more particularly of those derived from naphthaline and resorcin, as eosine, fluoresceine; also for exhibition of coal-tar products yielding these colors.

**298. Bindschedler & Busch, Basle, Switzerland.**

COAL-TAR COLORS.

*Report.*—Commended for the fine display of coal-tar colors of excellent quality and varied character; including methyl-violet, methyl-green, the eosine of Bayer, and artificial alizarine.

**299. Aniline Manufacturing Co., Berlin, Germany.**

## ANILINE COLORS AND COAL-TAR PRODUCTS.

*Report.*—Commended for the beauty of the collection of novel, various, and pure coal-tar colors; and for the successful application, on a manufacturing scale, of Coupiers' process for the production of aniline red without the use of arsenic acid or other mineral oxidizing agent.

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**300. Frankfort Aniline Factory, Gans & Leonhardt, Frankfort-on-the-Main, Germany.**

## ANILINE COLORS.

*Report.*—Commended for the excellence of display of aniline colors, as well as for a large production of arsenic acid for the use of aniline color manufacturers, and for the introduction of an improved method and apparatus for the extraction of aniline colors.

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**301. Max Singer, Tournai, Belgium.**

## ANILINE AND OTHER COAL-TAR DYES.

*Report.*—Commended for the excellent character of the colors exhibited, which are produced upon a large scale and include several samples of special interest, as aniline red free from arsenic, eosine, benzyl yellow, and naphthaline blue.

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**302. Guinon, Son, & Co., Lyons, France.**

## COAL-TAR COLORS.

*Report.*—Commended for the beauty of display of coal-tar colors, especially of those derived from phenol, including aurine, coralline, and picric acid of excellent quality.

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**303. A. Poirrier, Paris, France.**

## COAL-TAR COLORS.

*Report.*—Commended for the high quality of coal-tar colors generally, and display of products furnishing them; for introduction into manufacture of benzyl-chloride; and more especially of methyl-aniline and its derived violet and green coloring matters, whereby the use of iodine has come to be dispensed with: for introduction into manufacture of a new class of useful and cheap coloring matters known as *cachou de Laval*; also for fine quality of natural archil products.

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**304. Guillermo Davidson & Co., Orotava, Canary Islands.**

## COCHINEAL.

*Report.*—Commended for the fine quality of the three varieties of cochineal shown, viz., *plateada* (silver), *aconchada* (black), and *sacatilla* (intermediate in color), all of high tinctorial power.

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**305. Rafael Almeida Mateos, Las Palmas, Canary Islands.**

## COCHINEAL.

*Report.*—Commended for the exhibition of a very fine and instructive collection of cochineals of eight different grades, with statements of respective methods of drying, and prices.

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**306. Juan Rodriguez & Gonzales, Las Palmas, Canary Islands.**

## COCHINEAL.

*Report.*—Commended for the large grain and high colorific character of the fine black cochineal exhibited.

307. **Fr. Bayer & Co., Barmen, Germany.**

## COAL-TAR COLORS.

*Report.*—Commended for the illustration of the manufacture of artificial alizarine, and for the production of this compound in a high state of purity and on a large scale; also for beauty of display of coal-tar colors generally.

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308. **Y. Wada, Tokio, Japan.**

## INDIGO.

*Report.*—Samples of indigo of very superior quality are exhibited, as well as the leaves from which it is prepared.

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309. **Craig & Rose, Edinburgh, Scotland.**

## COLORS.

*Report.*—Commended for the important exhibit of manufactured mineral colors.

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310. **Marienberg Ultramarine Works, Bensheim, Germany.**

## COLORS.

*Report.*—Commended for excellent quality of ultramarines, clear green and pure blue; freshness of tint.

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311. **Francisco Rodoreda, Manila, Philippine Islands.**

## INDIGO.

*Report.*—Commended for the exhibition of a good and instructive collection of Manila indigo, of eight different grades, with prices affixed.

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312. **Nuremberg Ultramarine Works, Johann Zeltner, Nuremberg, Germany.**

## COLORS.

*Report.*—Commended for the ultramarine blues, which are distinguished for their brightness and freshness of tint; also the ultramarine violets, which this house first introduced into commerce.

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313. **F. Richter, Lille, France.**

## ULTRAMARINES.

*Report.*—Commended for a very good quality of blues in general, of strong coloring power and resisting well the action of alum. The quality of the blues for paper manufacture is especially noticed.

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314. **L. Vossen & Co., Aix-la-Chapelle, Germany.**

## PIGMENTS AND OIL AND WATER COLORS.

*Report.*—The manufactory produces numerous colors and lacquers and Paris blues in large quantities, of great purity of tints, and at low prices.

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315. **Adolphe Kaulek, Puteaux, France.**

## COLORS.

*Report.*—Commended for his exhibition of extracts of wood and his lakes, these products being of superior quality.



## 316. A. Lacroix, Paris, France.

COLORS.

*Report.*—Commended for specialty of vitrifiable colors, stability of tints in painting on porcelain and fine faience.

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## 317. C. G. Hardy-Milori, Grasse, France.

COLORS.

*Report.*—Commended for his mineral colors, most varied and worthy of attention.

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## 318. E. Coez &amp; Co., St. Denis, France.

COLORS.

*Report.*—Commended for the important manufacture of colors distinguished by purity of tint and fineness.

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## 319. G. Botelberge &amp; Co., Melle, near Ghent, Belgium.

ULTRAMARINES.

*Report.*—Commended for the careful manufacture of ultramarine blues of a quality corresponding to their cheapness.

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## 320. Rawlins &amp; Son, Prescott, England.

ULTRAMARINES.

*Report.*—Commended for the fine samples of blue and green ultramarines.

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## 321. George Rowney &amp; Co., London, England.

COLORS.

*Report.*—Commended for pigments remarkable for their fineness and their brilliancy, especially those intended for water-color use.

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## 322. Guimet, Lyons, France.

ULTRAMARINES.

*Report.*—Commended for blues of a very superior quality.

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## 323. Clauseau Father and Sons, Palun, &amp; Co., Avignon, France.

COLORS.

*Report.*—Commended for an exhibit of madder roots, superior quality of powdered madder, and of garancine, madder flowers, and alizarine.

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## 324. Bourgeois, Sr., Paris, France.

COLORS.

*Report.*—Commended for remarkably good colors for oil painting; the products shown are of first quality.

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## 325. T. W. Masury &amp; Son, New York, N. Y., U. S.

COLORS.

*Report.*—Commended for a very important exhibition of mineral colors for different uses, particularly for coach painting.

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326. D'Andrian & Wegelin, Mülhausen, Germany.

COLORS.

*Report.*—Commended for their important manufacture of carmines, indigo, lakes, and other colors. Impressions of different kinds attest the excellence of the products exhibited.

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## 327. Operative Chemical Works, Elbogen, Austria.

LUSTRE AND ENAMEL COLORS FOR PORCELAIN.

*Report.*—The lustre and enamel colors produced by this factory for porcelain, stoneware, and glass are noted for purity of color.

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## 328. Alexander Ecker, Stockerau, Austria.

COLORS.

*Report.*—Commended for his ochres and other mineral paints, of good quality.

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## 329. Ernst Riha, Pilsen, Austria.

COLORS.

*Report.*—Commended for his water colors; important manufacture of cheap products.

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## 330. F. Wueste, Pfaffstätten, Austria.

COLORS.

*Report.*—Commended for careful preparation of colors and printing-inks.

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## 331. Robert Gysae, Oberlössnitz, Dresden, Germany.

COLORS AND VARNISHES.

*Report.*—Commended for the good quality of colors and varnishes, especially for printing and lithography.

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## 332. Hirsch &amp; Merzenich, Cologne, Germany.

COLORS.

*Report.*—Commended for ochres and other mineral colors of superior quality.

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## 333. Kaiserslautern Ultramarine Works, Kaiserslautern, Germany.

ULTRAMARINES.

*Report.*—Commended for excellence of manufacture of ultramarine blues.

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## 334. Offergeld Brothers, Forest near Brussels, Belgium.

COLORS.

*Report.*—Commended for the extensive and cheap production of ochres for painting, by calcining certain iron minerals.

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## 335. Vincenzo Bassolini, Milan, Italy.

COLORS.

*Report.*—Commended for the beautiful collection of mineral colors exhibited, and for their good quality.

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**336. David Storer & Sons, Glasgow, Scotland.**

## COLORS.

*Report.*—Commended for the careful preparation of water colors.

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**337. State Government of Oaxaca, Mexico.**

## COCHINEAL AND CARMINE.

*Report.*—The cochineal (silver-gray) exhibited is of excellent tinctorial power, though not of large grain, and the carmine prepared from it presents a fine tint, rich and delicate.

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**338. State Government of Colima, Mexico.**

## INDIGO.

*Report.*—Commended for the good quality of indigo contributed,—light, clean, with good coppery streak.

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**339. Heller & Merz, New York, N. Y., U. S.**

## ULTRAMARINE BLUE.

*Report.*—Commended for brilliancy, strength of color, and purity of tint.

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**340. Przibram & Co., Vienna, Austria.**

## ARTIFICIAL ALIZARINE.

*Report.*—Commended for an important series of fine and large specimens of artificial alizarine in paste, including different shades of color; of the same sublimed; of anthracene, anthrachinone, and other intermediate products.

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**341. Page, Kidder, & Fletcher, New York, N. Y., U. S.**

## COAL-TAR PRODUCTS.

*Report.*—Commended for the most complete and extensive variety of coal-tar products, illustrating the chemistry of the benzole series; great variety and superior purity of the commercial products of coal tar; instructive illustrations of the various applications of coal-tar products in the arts.

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**342. Marx & Rawolle, New York, N. Y., U. S.**

## GLYCERINE, SHELLAC, LACQUER, AND VARNISHES.

*Report.*—Commended for the excellent quality of glycerine, lacquers, and varnishes.

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**343. Charles Turner & Son, London, England.**

## VARNISHES FOR RAILWAY COMPANIES, GUMS, LINSEED OIL, AND SPIRIT OF TURPENTINE.

*Report.*—Commended for the superior quality of the varnishes, and of the raw materials employed in their manufacture.

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**344. D. Rosenberg & Sons, New York, N. Y., U. S.**

## VARNISHES.

*Report.*—Commended for an exhibition of a great variety of varnishes for wood and metal, all of very superior quality.

## 345. Wm. Zinsser &amp; Co., New York, N. Y., U. S.

SHELLAC, VARNISHES, LACQUERS, AND SEALING WAX.

*Report.*—Commended as a very fine exhibit of bleached and refined shellac, in great variety of colors, sealing wax, varnishes, and lacquers of numerous colors, all of excellent quality.

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## 346. John Mackay, Edinburgh, Scotland.

VARNISHES.

*Report.*—Commended for excellent quality of spirit varnishes for wood work.

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## 347. William Hartmann, Riga, Russia.

VARNISHES.

*Report.*—Commended for excellent quality and great variety of varnishes.

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## 348. Peter Poiteling, St. Petersburg, Russia.

VARNISHES.

*Report.*—Commended for great variety and excellent quality of varnishes.

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## 349. Diego Perez Romero, Huelva, Spain.

VARNISH FOR PHOTOGRAPHIC PICTURES.

*Report.*—Commended for the excellent character of photographic varnish shown; bright, clear, and capable of retaining its surface, as shown by sample photographs of definite date.

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## 350. Christian Hoegh Guldberg, Copenhagen, Denmark.

VARNISH.

*Report.*—Commended for the excellent quality of varnish (gum-lac) for fine wood work.

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## 351. Felton, Rau, &amp; Sibley, Philadelphia, Pa., U. S.

VARNISHES.

*Report.*—Commended for the superior quality of varnishes for various purposes.

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## 352. Cesare Bonacina, Milan, Italy.

VARNISHES AND INKS.

*Report.*—Commended for good quality.

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## 353. Andes &amp; Son, Vienna, Austria.

VARNISHES.

*Report.*—Commended for the fine samples of varnishes.

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## 354. V. Lousbergh, The Hague, Netherlands.

VARNISH.

*Report.*—Commended for the economic production of a good black varnish with tar base.

## 355. Miles Williams, Wigan, Lancashire, England.

## VARNISH AND VARNISH PAINTS.

*Report.*—Commended for the good quality of varnishes.

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## 356. Charles C. Phillips, Philadelphia, Pa., U. S.

## VARNISHES AND JAPAN.

*Report.*—Commended for the great variety and superior quality of the varnishes, especially the body varnish.

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## 357. John Bond's Daughter (Mrs. Hickisson), London, England.

## MARKING INK.

*Report.*—Commended for the superior quality and permanence of the ink.

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## 358. Joseph S. C. Rowland, M.D., Philadelphia, Pa., U. S.

## CANCELING INK AND CANCELING INK PAD.

*Report.*—Commended for freedom from gums and resins, cleanliness of the pads, great rapidity in drying of the ink, and great permanency of its stain under the use of re-agents.

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## 359. Continental Manufacturing Co., Philadelphia, Pa., U. S.

## INKS AND MUCILAGE.

*Report.*—The products shown by this firm are of meritorious quality, their black ink and writing fluid and light-colored mucilage especially deserving notice.

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## 360. Thaddeus Davids &amp; Co., New York, N. Y., U. S.

## INKS, MUCILAGE, WAFERS, AND SEALING WAX.

*Report.*—Commended for a very fine exhibit of a great variety of superior writing and copying inks, ruling inks, stamping inks, marking inks, mucilage, sealing wax, and wafers.

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## 361. Francis &amp; Loutrel, New York, N. Y., U. S.

## COPYABLE PRINTING INKS.

*Report.*—Commended for the great variety and superior quality of copyable printing inks.

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## 362. Joseph Fromherz, Cincinnati, Ohio, U. S.

## INKS.

*Report.*—Commended for excellent quality of writing fluids, copying and carmine inks, and mucilage.

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## 363. Joseph E. Hover &amp; Co., Philadelphia, Pa., U. S.

## INKS.

*Report.*—The various inks shown for ordinary writing, copying, recording important papers, and marking clothing, are of good quality and write freely and well. The "unalterable" ink for deeds, etc., withstands the action of a number of powerful re-agents.

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**364. Charles Eneu Johnson & Co., Philadelphia, Pa., U. S.**

## PRINTING INKS.

*Report.*—Commended for superior quality and great variety of colored printing inks, especially the glossy jet black, with samples printed by the same.

**365. Lockwood, Brooks, & Co., Boston, Mass., U. S.**

## INKS AND MUCILAGE.

*Report.*—Commended, as this house exhibits a handsome collection of inks and mucilages of good quality. The black writing and copying fluid ink is more particularly worthy of praise.

**366. George Mather's Sons, New York, N. Y., U. S.**

## PRINTING INKS.

*Report.*—Commended for a varied and important display of inks for type and lithographic printers' use. All are deserving of attention, but especially the fine grades of black ink. The colored and lithographic inks are also of very great excellence.

**367. Maynard & Noyes, Boston, Mass., U. S.**

## INKS.

*Report.*—This house exhibits a variety of black, blue, red, and violet writing and copying inks of excellent quality.

**368. Carter, Dinsmore, & Co., Boston, Mass., U. S.**

## INKS AND MUCILAGE.

*Report.*—Commended for excellent quality and variety of writing fluids, copying inks, and mucilage.

**369. John Raynold, Philadelphia, Pa., U. S.**

## INK.

*Report.*—Commended for great variety of colored inks (fourteen), and writing fluids and copying inks, of excellent quality.

**370. Robinson & Pratt, Philadelphia, Pa., U. S.**

## PRINTING INKS.

*Report.*—Commended for the good quality of printing inks and gloss varnish exhibited; a cheap black ink is particularly deserving of notice and commendation.

**371. J. S. Thomson, New York, N. Y., and Erie, Pa., U. S.**

## NON-ERASABLE AND OTHER INKS.

*Report.*—The exhibit consists of a variety of writing fluids: black copying, carmine, blue, green, and artists' ink, and especially a very superior non-erasable record ink.

**372. John Underwood, New Durham, N. J., U. S.**

## INKS.

*Report.*—Commended for a superior kind of copying ink for obtaining a great number (thirty-five) of copies, especially valuable for railroads, etc.; also copyable printing ink of excellent quality, and safety checks. The latter are peculiar from the fact that, if written with an ordinary iron ink, the writing becomes indelible when an attempt is made to take it out by acids, etc., whilst the appearance of the check is destroyed.

**373. Wm. Lyons, Manchester, England.**

INKS.

*Report.*—Commended for writing and copying inks of good quality.**374. Lankofski & Likop, Mitau, Russia.**

INKS.

*Report.*—Commended for great variety and excellent quality of inks and writing fluids.**375. Fletcher & Dwyer, Lynn, Mass., U. S.**

BURNISHING INK FOR HEELS OF BOOTS AND SHOES.

*Report.*—Commended for the excellent quality of the burnishing ink exhibited, intended for manufacturers' use in finishing the heels, shanks, and edges of boots and shoes. A good practical test of its character is afforded by its use in the finishing operations daily carried on in the Shoe and Leather Building on the Exhibition grounds.**376. First Japanese Manufacturing & Trading Co., Tokio, Japan.**

INDIA INK.

*Report.*—Commended for a fine collection of Japanese ink (finely divided carbon with gelatine) in sticks of many forms and several grades of excellency.**377. Holmens Technical Works (Inglesang), Christiania, Norway.**

INKS AND BLACKING.

*Report.*—Commended for the excellent quality of writing and copying ink and blacking; also aseptin amykos.**378. G. Toiray-Maurin, Paris, France.**

WRITING INKS.

*Report.*—Commended for excellent quality.**379. Fd. Larenaudière, Paris, France.**

INKS.

*Report.*—Commended for the good quality of the ordinary black and violet inks.**380. S. Samuel G. da Silva, Rio de Janeiro, Brazil.**

INKS.

*Report.*—Commended for the exhibition of carmine and violet inks of good quality.**381. Giovanni Guocchi, Milan, Italy.**

INKS.

*Report.*—Commended for the good quality of black, violet, and red inks.**382. Eduard Beyer, Chemnitz, Germany.**

INKS.

*Report.*—Commended for the extensive manufacture of inks of superior quality, and especially of copying inks.

**383. Ferdinand Fritsch, Vienna, Austria.**

## INKS.

*Report.*—Commended for the variety and good quality of the inks, especially the copying inks.

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**384. G. C. Hisgen, Nassmühle, near Hanau, Germany.**

## INKS.

*Report.*—Commended for an important manufacture of different inks. The exhibition of numerous samples illustrates the quality of the products.

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**385. Ferreira Maia & Co., Pernambuco, Brazil.**

## INKS.

*Report.*—Commended for good quality of the samples of copying inks.

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**386. João Ferreira Villela, Rio de Janeiro, Brazil.**

## INKS.

*Report.*—Commended for the good quality of the black and colored inks.

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**387. Brunschweiler & Son, St. Gallen, Switzerland.**

## INKS.

*Report.*—Commended for the good quality of the printing and telegraphic inks.

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**388. F. A. Strandberg, Jönköping, Sweden.**

## INKS AND VARNISHES.

*Report.*—Commended for the good quality of the inks and varnishes.

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**389. L. Antoine Son, Paris, France.**

## INKS.

*Report.*—Commended for the excellent quality of violet and black inks; good impressions from the copying inks.

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**390. Imperial Maritime Customs of China.**

## INDIAN INK.

*Report.*—Commended for the exhibition of a splendid collection of Indian or China inks of various grades, including specimens from the Imperial factory of Hweichow-fu.

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**391. A. Lyman Williston, Northampton, Mass., U. S.**

## PAYSON'S INDELIBLE INK.

*Report.*—Commended for simplicity of application and indelibility.

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**392. Henry Charles Stephens, London, England.**

## INKS.

*Report.*—Commended for samples attesting the quality of the inks, and particularly the colored and copying inks. The samples of painted wood are likewise worthy of remark.



393. **Monteiro & Co., Rio de Janeiro, Brazil.**

## INKS.

*Report.*—Commended for the good quality of their copying inks and blue and green inks; improvements in Brazil.

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394. **John Blackwood & Co., London, England.**

## INKS.

*Report.*—Commended for their inks of good quality, particularly those into the composition of which aniline and vanadic acid enter, and which serve as indelible inks for linen.

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395. **Charles Bowman, London, England.**

## INKS.

*Report.*—Commended for the good quality of their blue, red, and black marking ink (solid stencil ink).

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396. **Eastman & Brooke, Philadelphia, Pa., U. S.**

## KITCHEN CRYSTAL SOAP, AND DRESSING FOR LADIES' SHOES.

*Report.*—The dressing exhibited by this firm is of decidedly superior character. The scouring soap shown is also of good quality.

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397. **H. A. Bartlett & Co., Philadelphia, Pa., U. S.**

## BLACKING.

*Report.*—The paste blacking of this house gives a good polish and dead black color upon the surface of boots and shoes.

---

398. **S. M. Bixby & Co., New York, N. Y., U. S.**

## BLACKING AND SHOE DRESSING.

*Report.*—The paste blacking exhibited is of decidedly superior quality, giving with ease a fine polish upon boots and shoes. The dressing for ladies' shoes also gives good results, and the harness oil seems well adapted to soften and preserve heavy leather.

---

399. **B. F. Brown & Co., Boston, Mass., U. S.**

## DRESSING FOR LADIES' SHOES, AND BLACKING.

*Report.*—The fine dressing for ladies' shoes exhibited by this firm, and for many years manufactured upon a large scale, is of excellent quality, and gives readily a good polish upon dressed leather when worn. The solid (paste) blacking is also worthy of commendation.

---

400. **C. L. Hawthaway & Sons, Boston, Mass., U. S.**

## DRESSINGS AND BURNISHING INK FOR LEATHER.

*Report.*—The collection of dressings, burnishing ink, stains, varnishes, harness oil, and other preparations used by manufacturers in finishing boots, shoes, and harness, is very extensive, and the individual articles are of great excellence. The dressing for domestic use on ladies' shoes is also very good.

## 401. James S. Mason &amp; Co., Philadelphia, Pa., U. S.

## PASTE BLACKING.

*Report.*—The paste blacking exhibited by this house gives excellent results in use, and appears to merit special notice in reference to its capability of resisting change when kept for many years, even in warm climates.

## 402. Frank Miller, Son, &amp; Co., New York, N. Y., U. S.

## HARNESS OIL AND BLACKING.

*Report.*—This house exhibits harness oil, dressing for ladies' shoes, and improved blacking, all of good quality, the first particularly creditable.

## 403. George A. Moss, New York, N. Y., U. S.

## DRESSING FOR LADIES' SHOES.

*Report.*—The gloss given by the dressing which this exhibitor presents is decidedly of superior character.

## 404. Restorff, Bettmann, &amp; Co., New York, N. Y., U. S.

## DRESSING FOR LADIES' SHOES.

*Report.*—The dressing exhibited readily gives a good surface to soiled or worn shoes, and appears to be composed of suitable and non-injurious material.

## 405. Franco-American Blacking Co. (Levi &amp; Berg, Managers), Philadelphia, Pa., U. S.

## BLACKING.

*Report.*—The blacking and the dressing for ladies' shoes exhibited by this house are among the best of those examined.

## 406. John Annear, Philadelphia, Pa., U. S.

## BLACKING.

*Report.*—The finer grade of blacking exhibited is of excellent character and contains very little surplus acid. It is put up in a new and convenient form of box for use.

## 407. L. Chiraux, Cambrai, France.

## BLACKING.

*Report.*—Commended for very good quality of blacking.

## 408. A. Jacquot &amp; Co., Paris, France.

## BLACKING.

*Report.*—A product of first quality.

## 409. Berthoud &amp; Co., Paris, France.

## BLACKING.

*Report.*—Commended for the fineness and brilliancy of the blacking exhibited.

## 410. Arthur B. Morrison, Portland, Me., U. S.

GOLD AND SILVER SOLUTIONS.

*Report.*—That it is an article that can be employed in domestic use, often with good results.

---

## 411. Fr. Nüchterlein, Fürth, Bavaria, Germany.

LEAF METAL, BRONZE POWDER, AND BROCADE.

*Report.*—Commended for richness of tints of the samples of bronze colors; excellent quality, and cheapness.

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## 412. G. L. Fuchs &amp; Sons, Fürth, Bavaria, Germany.

LEAF METAL, BRONZE POWDERS, AND BROCADES.

*Report.*—Commended for bronze colors, brocades, lazur gold, and leaf metal of excellent quality.

---

## 413. H. &amp; Chr. Reich, Nuremberg, Germany.

LEAF METAL, BRONZE POWDERS, AND BROCADES.

*Report.*—Commended for the excellent quality in regard to size of leaf metal and fineness of color.

---

## 414. American Bronze Powder Co., Brooklyn, N. Y., U. S.

BRONZE POWDERS.

*Report.*—These bronze powders are of a most excellent character.

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## 415. Fr. Metz, Fürth, Bavaria, Germany.

BRONZE POWDERS.

*Report.*—Commended for the variety of the samples exhibited, in regard to purity of color and degree of fineness.

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## 416. J. C. Meier, Fürth, Bavaria, Germany.

LEAF METAL AND BRONZE POWDERS.

*Report.*—Commended for great beauty and cheapness.

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## 417. I. L. &amp; P. Weidner, Nuremberg, Germany.

LEAF METAL, BRONZE POWDERS, AND BROCADES.

*Report.*—Commended for the unusual size of the form of leaf metal; introduction of essential improvements in the manufacture.

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## 418. Leo Haenle, Munich, Germany.

BRONZE POWDERS AND BROCADES.

*Report.*—Commended for bronze colors and brocades for lithographic purposes; excellent quality of the products, at a low price.

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## 419. Zucker &amp; Levett, New York, N. Y., U. S.

POLISHING MATERIALS.

*Report.*—Commended for excellent quality of hard and soft rouges for polishing metals.

**420. George Zucker, New York, N. Y., U. S.**

ROUGES AND COMPOSITIONS.

*Report.*—Commended for superior quality of compositions and hard and soft rouges for polishing and giving the finest finish to gold, silver, nickel, and horn.

---

**421. Eiermann & Tabor, Fürth, Germany.**

LEAF METAL, BRONZE POWDER, AND METAL FOIL, PLAIN AND COLORED.

*Report.*—Commended for great variety of products, excellent quality, and cheapness.

---

**422. I. W. Cramer, Fürth, Germany.**

LEAF SILVER, LEAF METAL, AND LEAF ALUMINIUM.

*Report.*—Commended for very beautiful manufacture.

---

**423. L. Brandeis & Co., New York, N. Y., U. S.**

BRONZE POWDERS.

*Report.*—Commended for the very excellent quality of numerous shades of bronze powders, especially a very superior lining bronze.

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**424. Young & Strang, Glasgow, Scotland.**

BRITISH GUM.

*Report.*—Commended for superior quality of artificial gums and of lactarine for the use of calico printers and finishers.

---

**425. E. Marcellis, Buenos Ayres, Argentine Republic.**

ANIMAL CHARCOAL.

*Report.*—Commended for the clean, well-charred condition of their product, for which an immense supply of crude material exists in the Argentine Republic.

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**426. Bihn & Co., Bridesburg, Philadelphia, Pa., U. S.**

LAMPBLACK.

*Report.*—Commended for various grades and styles of lampblack of excellent quality.

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**427. L. Martin & Co., Philadelphia, Pa., U. S.**

LAMPBLACK.

*Report.*—The products are of the very finest character, and the variety very great. The higher grades of black are of the most exquisite character.

---

**428. Constantin Przeciszewski, Warsaw, Russia.**

WHITE CALCINED BONE AND ANIMAL BLACK PULVERIZED.

*Report.*—Commended for the excellent quality and careful manufacture of white calcined bone and of powdered bone black.

---

**429. Jacquand Father & Son, Lyons, France.**

ANIMAL BLACK.

*Report.*—Commended for the glue and bone preparations, and especially for the good quality of the animal black exhibited.

## 430. Kokosing Oil Co., Gambier, Ohio, U. S.

## LAMPBLACK.

*Report.*—Commended for very excellent quality of the lampblack manufactured by partial combustion of marsh gas from the gas-wells of this region. This source of the carbon, and the special process of manufacture, constitute real improvements in the production of fine lampblack for making choice printers' ink.

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## 431. George S. Coyne (Chester Chemical Works), Delaware County, Pa., U. S.

## DYEWOOD-EXTRACT LIQUORS, ACIDS, AND CHEMICALS.

*Report.*—Acids, chemicals, dyewood-liquors, expressly prepared for the use of cotton, woolen, and silk dyers, calico printers, and carpet manufacturers, of excellent quality.

---

## 432. John M. Sharpless &amp; Co., Philadelphia, Pa., U. S.

## EXTRACTS OF LOGWOOD.

*Report.*—The exhibit consists of the principal dyewoods used in this country of prime quality, and solid and liquid extract of logwood of perfect purity and superior quality, manufactured at their Waterville Mills, Pennsylvania. Commended for superior quality of extract of logwood.

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## 433. J. &amp; J. Miller &amp; Co., Boston, Mass., U. S.

## EXTRACT OF HEMLOCK BARK, FOR TANNERS' USE.

*Report.*—Commended for excellent quality of extract of hemlock bark shown.

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## 434. I. H. Heald &amp; Co., Lynchburg, Va., U. S.

## EXTRACT OF BARK FOR TANNERS' USE.

*Report.*—Commended for the good quality of liquid extract of chestnut-oak bark for tanners' use, made at Lynchburg, Virginia, by infusion and evaporation in vacuum-pans, and presenting in a concentrated form the tannin of one of the best American barks.

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## 435. Ed. Loeffund, Stuttgart, Germany.

## MALT EXTRACT AND MALT EXTRACT BONBONS.

*Report.*—Commended for the manufacture of these products on scientific principles.

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## 436. F. Pauli, Stockholm, Sweden.

## PERFUMERY.

*Report.*—Commended for the truly superior quality of his perfumes, and the good quality of his toilet soaps.

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## 437. Malcom &amp; Stevenson, Philadelphia, Pa., U. S.

## FLAVORING EXTRACTS.

*Report.*—Commended for the general excellence of flavoring extracts prepared from spices and fruits, chiefly for culinary purposes.

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## 438. Agapito Fontecilla, Vera Cruz, Mexico.

## VANILLA.

*Report.*—Commended for the excellent quality of vanilla, highly fragrant and in good condition.

## 439. José L. Silvera, Vera Cruz, Mexico.

## VANILLA.

*Report.*—The vanilla beans exhibited are extremely fragrant and in fine condition.

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## 440. Joseph Burnett &amp; Co., Boston, Mass., U. S.

## COLOGNE AND FLAVORING EXTRACTS.

*Report.*—Commended for the merit of their cologne, and for their flavoring extracts and other articles exhibited, which show care and skill.

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## 441. Oscar Reymann, Manila, Philippine Islands.

## ESSENCE OF YLANG-YLANG (PERFUME).

*Report.*—Commended for the great fragrance and purity of the fine sample of this valuable perfume.

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## 442. Domingo Forner Sales, Burriana, Castellon, Spain.

## ORANGE-FLOWER WATER.

*Report.*—The orange-flower water shown is of remarkably fine quality and more than usual strength. It is produced in large quantity.

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## 443. A. H. Riise, St. Thomas, Danish West Indies.

## BAY SPIRIT (PERFUME).

*Report.*—The bay spirit shown (double distilled) is fragrant and well prepared from native material in St. Thomas.

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## 444. Philippopolis Christo, Adrianople, Turkey.

## ATTAR OF ROSE.

*Report.*—Commended for the exhibition of attar of rose of very excellent character and enduring perfume.

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## 445. Hamooda Azuz, Tunis.

## ATTARS OF ROSE AND JASMINE.

*Report.*—Commended for the fragrance and delicacy of the perfumes exhibited, especially the attars of rose and jasmine.

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## 446. Dr. L. Naumann, Dresden, Germany.

## FRUIT JUICES, SPICES, EXTRACTS, AND SALTS.

*Report.*—Commended for the preparation of spices and spice extracts for use with food.

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## 447. E. Colas &amp; C. Christoff, Paris, France.

## ESSENCE OF ROSE.

*Report.*—Commended for the excellence of their essence of rose.

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## 448. Felice Lacaria, Reggio di Calabria, Italy.

## ESSENCES.

*Report.*—Commended for good quality.

## 449. Agrarian Society of Aci Reale, Sicily, Italy.

## ESSENCES.

*Report.*—Commended for the good quality of the essences of lemon.

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## 450. De Lieto Brothers, Reggio di Calabria, Italy.

## ESSENCES OF LEMON.

*Report.*—Commended for the good quality of the essences exhibited.

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## 451. Ignazio Siles, Reggio di Calabria, Italy.

## ESSENCES.

*Report.*—Commended for good quality.

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## 452. Gottfried Konnstein, Prague, Austria.

## ESSENCES FOR THE MANUFACTURE OF LIQUORS.

*Report.*—Commended for the good quality of the essences intended for the manufacture of liquors; for the importance given to this manufacture.

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## 453. Santi di Pasquale &amp; Son, Messina, Italy.

## ESSENCES AND EXTRACTS.

*Report.*—Commended for the good quality of the essences of lemon, bergamot, and orange; for the great importance of the manufacture, and for improvements introduced in the purification of extracts of licorice.

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## 454. Low, Son, &amp; Haydon, London, England.

## PERFUME EXTRACTS AND TOILET SOAPS.

*Report.*—Commended for the excellent quality of their perfumes and soaps.

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## 455. Hermann A. Holstein, Constantinople, Turkey.

## ATTAR OF ROSE, MASTIC, AND TRAGACANTH.

*Report.*—Attar of rose is shown by this exhibitor in large quantity and of very fine character. He has also a remarkably fine collection of mastic, tragacanth, nut-galls, Persian berries, and essential oil of rose geranium.

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## 456. D. Pappazoglou, Constantinople, Turkey.

## ATTAR OF ROSE.

*Report.*—Commended for the fine character and delicate perfume of the attar of rose exhibited in very considerable quantity.

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## 457. Schimmel &amp; Co., Leipsic, Germany.

## ETHERS, OILS, AND ESSENCES FOR PERFUMERY.

*Report.*—Commended for the excellent quality of the products manufactured by this firm; for the importance and improvement given to the manufacture.

## 458. Alexander Fries &amp; Brothers, Cincinnati, Ohio, and New York, N. Y., U. S.

ETHERS AND ESSENCES PRODUCED FROM THEM, AND OLEO-MARGARINE.

*Report.*—Commended for the variety and chemical purity of artificial ethers exhibited, and for delicacy of flavor of fruit essences produced from them; also for production on a large scale, from fresh bullocks' fat, of an excellent butter substitute known as oleo-margarine.

## 459. Fritzsche, Schimmel, &amp; Co., New York, N. Y., U. S.

ESSENTIAL OILS AND ESSENCES.

*Report.*—Commended for the good quality of the articles exhibited.

## 460. Hale &amp; Parshall, Lyons, N. Y., U. S.

OILS OF PEPPERMINT, SPEARMINT, WORMWOOD, AND TANSY.

*Report.*—Commended for the good quality of these oils, which they distill from plants grown by them and by others in Wayne County, New York.

## 461. H. G. Hotchkiss, Lyons, N. Y., U. S.

OIL OF PEPPERMINT AND OTHER ESSENTIAL OILS.

*Report.*—Commended for the beauty and purity of their products.

## 462. L. B. Hotchkiss, Phelps, N. Y., U. S.

OILS OF PEPPERMINT, SPEARMINT, WINTERGREEN, AND TANSY.

*Report.*—Commended for the excellence of his products.

## 463. A. M. Todd, Nottawa, Mich., U. S.

OIL OF PEPPERMINT.

*Report.*—Commended for a good exhibit of an important industry.

## 464. Wolf Brothers &amp; Keech, Centreville, Mich., U. S.

ESSENTIAL OILS.

*Report.*—Commended for a fine display of oils of peppermint, spearmint, wormwood, tansy, and pennyroyal, possessing a soft, rich flavor, obtained from plants of their own raising.

## 465. Kluge &amp; Pöritzsch, Leipsic, Germany.

ESSENTIAL OILS, ESSENCES, AND FRUIT ETHERS.

*Report.*—Commended for excellent products, remarkable for purity and cheapness.

## 466. I. Bernhardt, Leipsic, Germany.

ESSENTIAL OILS, ESSENCES, AND EXTRACTS.

*Report.*—Commended for great purity and cheapness.

## 467. Gödecke &amp; Co., Leipsic, Germany.

ESSENTIAL OILS AND FRUIT ETHERS.

*Report.*—Commended as remarkable for purity and cheapness.



## 468. Heinrich Heansel, Pirna-on-the-Elbe, Germany.

## ESSENTIAL OILS AND ESSENCES OF LIQUORS.

*Report.*—Commended for the very excellent manufacture of ethereal oils, liquors, and essences, which are valuable for the preparation, on technological principles, of brandy and liquors of all kinds.

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## 469. Samuel Perks, Hitchin, Herts, England.

## ESSENTIAL OIL OF LAVENDER AND EXTRACT OF LAVENDER FLOWERS.

*Report.*—Commended for the excellent quality of the products. This house makes a speciality of the manufacture of essence of lavender.

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## 470. Joseph Bosisto, Richmond, Melbourne, Victoria, Australia.

## ESSENTIAL OIL OF EUCALYPTUS, POTASH FROM THE MALLEE SHRUB, AND ESSENTIAL OIL OF MALLEE SHRUB.

*Report.*—Commended for the production of essential oil of eucalyptus, capable of use in perfumery; for the experiments made for utilizing the mallee shrub and other Australian plants in the production of useful substances, such as gums, oils, and potash.

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## 471. Augustin Westernhagen, Manila, Philippine Islands.

## ESSENTIAL OILS.

*Report.*—Commended for the display of a valuable collection of essences (and some fat oils) from the Philippine Islands. The essences of champaca, ylang-ylang, and sampaginta are particularly worthy of notice, both as to quantity and high character.

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## 472. Lunatic Asylum Commissioners of Tasmania, Tasmania.

## ESSENTIAL OIL OF EUCALYPTUS GLOBULUS.

*Report.*—Commended for a good display of the essential oil of the blue gum tree (*Eucalyptus globulus*), in considerable quantity.

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## 473. Robert Thomson, Gordon Town, Jamaica

## ESSENTIAL OILS.

*Report.*—Commended for excellence of quality of essential oils distilled from native plants.

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## 474. E. Sachse &amp; Co., Leipsic, Germany.

## ESSENTIAL OILS AND FRUIT ETHERS.

*Report.*—Commended for the production of excellent essential oils and fruit ethers.

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## 475. Haas &amp; Rosenfeld, Gaya, Austria.

## ESSENTIAL OILS.

*Report.*—Commended for the excellent quality of the essential oils of the seeds of anise, caraway, fennel, coriander; also of calamus, absinthe, and two varieties of cognac oil.

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## 476. Jacob Brichta, Buda-Pest, Hungary, Austria.

## ESSENTIAL OILS OF THE BERRIES AND WOOD OF JUNIPER.

*Report.*—Commended for the very fine quality of the essential oils of the berries and wood of juniper

## 477. Maximino Río de la Loza, City of Mexico, Mexico.

## ESSENTIAL OILS.

*Report.*—The collection of essential oils shown contains specimens, on a pretty large scale, carefully prepared, and of excellent character. The essence of lignaloes (wood of *Amyris lignaloes*), and that of torongil (*Cedronella Mexicana*), are specially meritorious.

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## 478. W. S. Grayling, Taranaki, New Zealand.

## WOOD EXTRACTS.

*Report.*—Commended for the quality of extracts applicable to the tanning of leather.

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## 479. The Thomas Extract Co., Elmira, N. Y., U. S.

## EXTRACT OF HEMLOCK BARK.

*Report.*—Commended for the excellent quality of both samples of syrupy extract of hemlock bark exhibited, prepared at two different factories, rich in tannin, clear, bright, light in color, and free from mould.

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## 480. Wenck &amp; Co., New York, N. Y., U. S.

## PERFUMERY AND TOILET PREPARATIONS.

*Report.*—Commended for the good quality and variety of the articles of perfumery manufactured by this firm.

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## 481. C. B. Woodworth &amp; Son, Rochester, N. Y., U. S.

## PERFUMES IN GENERAL.

*Report.*—Commended for the very great variety and beauty of their exhibit, combined with the excellent quality of the materials used in their preparations.

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## 482. Leão &amp; Alves, Porto Alegre, Brazil.

## OILS AND PERFUMERY.

*Report.*—The collection of fat oils, chiefly vegetable, and the perfumed extracts and pomades, shown by this firm, are worthy of attention, especially the extracts of vanilla and baboza (*Aloes Brasiliensis*) from native material.

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## 483. Julio Maria Paez, Havana, Cuba.

## PERFUMED EXTRACT.

*Report.*—Commended for the fragrance and delicacy of the perfumed extract exhibited, said to be produced from indigenous flowers of Cuba.

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## 484. Daniel Steen, Christiania, Norway.

## PERFUMES AND TOILET SOAPS.

*Report.*—Commended for a very creditable display of perfumery in various forms,—extracts for the handkerchief, toilet vinegar, perfumed sachets, and fine soaps, all produced in quantity, and illustrating a well-established industry.

## 485. Roure-Bertrand Son, Grasse, France.

RAW MATERIALS FOR PERFUMERY, EXTRACTS, AND ESSENCES.

*Report.*—Commended for the excellent and superior quality of the products.

## 486. Rigaud &amp; Co., Paris, France.

TOILET SOAPS AND PERFUMERY.

*Report.*—Commended for excellent quality.

## 487. J. Mottet &amp; Co., Marseilles, France.

RAW MATERIALS FOR PERFUMERY; OLIVE OIL.

*Report.*—Commended for the excellent quality of raw materials for perfumery, and for the excellent quality of their olive oil.

## 488. Lautier Son, Grasse, France.

RAW MATERIALS FOR PERFUMERY.

*Report.*—Commended for the excellent quality and improved manufacture of the products.

## 489. Daubin &amp; Co., Paris, France.

FATS FOR PERFUMERY AND FOOD; FLY-PAPER.

*Report.*—Commended for the excellent preparation and long preservation of the fats, and for the good quality of the goods shown.

## 490. Adolphe Delettretz, Paris, France.

PERFUMERY.

*Report.*—Commended for the superior quality of his products, which are characterized by an odor and fineness quite remarkable.

## 491. Eugene Rimmel, London, England.

PERFUMERY AND TOILET ARTICLES; PERFUME VAPORIZERS.

*Report.*—Commended for the excellent quality and cheapness of his products, and the improvements introduced in the industry of perfumes.

## 492. The Eau de Cologne Manufactory, Arnhem, Netherlands.

EAU DE COLOGNE.

*Report.*—Commended for excellent quality and cheapness.

## 493. J. Hambleton &amp; Son, Philadelphia, Pa., U. S.

PERFUMES, POMADES, COSMETICS, AND EAU DE COLOGNE.

*Report.*—Commended for the good quality of the products manufactured, and for the considerable importance given to their production.

## 494. W. H. Read, Baltimore, Md., U. S.

EAU DE COLOGNE.

*Report.*—Commended for the good quality of cologne water.

## 495. Louis Herman, Paris, France.

RAW MATERIALS FOR PERFUMERY; PARFUMS À LA VIOLETTE.

*Report.*—Commended for the excellent quality of the products.

## 496. Johann Maria Farina, Jülichspatz, Cologne, Germany.

EAU DE COLOGNE.

*Report.*—Commended for the good quality of the product.

## 497. F. Maria Farina, Glockengasse, Cologne, Germany.

COLOGNE WATER, PERFUMES, AND SOAPS.

*Report.*—Commended for the superior quality of the products.

## 498. Pietro Bartolotti Ditta, Bologna, Italy.

PERFUMES.

*Report.*—Commended for the good quality of the acqua di Felsina.

## 499. J. &amp; E. Atkinson, London, England.

PERFUMERY AND TOILET SOAPS.

*Report.*—Commended for the superior quality of the products.

## 500. Crown Perfumery Co., London, England.

PERFUMES AND TOILET REQUISITES.

*Report.*—Commended for the excellence of their products, and particularly for the superiority of their essences and lavender water.

## 501. W. H. Savournin, Philadelphia, Pa., U. S.

TOILET POWDERS.

*Report.*—The exhibitor makes a specialty of the manufacture of this class of articles, which are of every variety and of excellent quality.

## 502. J. Demartini, Prague, Austria.

PERFUMES AND SOAPS.

*Report.*—Commended for the quality and cheapness of his perfumery; for the beautiful imitation, in soap, of fruits, at a low price.

## 503. Calderara &amp; Bankmann, Vienna, Austria.

PERFUMES AND SOAPS.

*Report.*—Commended for the excellence of their perfumes and soaps, at a low price.

## 504. Auguste de Marbaix, Anvers, Belgium.

ANTWERP WATER, DISTILLED SPIRITS, AND ESSENTIAL OILS.

*Report.*—Commended for good quality and cheapness, especially of L'eau d'Anvers (Antwerp water).

## 505. F. Linde, St. Petersburg, Russia.

## SOAPS AND PERFUMERIES.

*Report.*—Commended for good quality and cheapness.

## 506. Friedrich Wolff &amp; Son, Carlsruhe and Berlin, Germany.

## PERFUMERY AND TRANSPARENT SOAP.

*Report.*—Commended for the excellent quality of his perfumes; for the careful preparation of his transparent glycerine soaps, and their good quality.

## 507. Bernhard Langwisch, Hamburg, Germany.

## TOILET POWDERS; THE SAME FOR THEATRES.

*Report.*—Commended for the good quality of the products.

## 508. Gustav Lohse, Berlin, Germany.

## PERFUMERY.

*Report.*—Commended for the superior quality of the products.

## 509. R. &amp; G. A. Wright, Philadelphia, Pa., U. S.

## TOILET SOAPS AND POMADES.

*Report.*—Commended for the good quality of their toilet soaps. The glycerine tablets are quite fine in appearance; their pomades good; and all their articles put up with good taste

## 510. Young, Ladd, &amp; Coffin (Lundberg), New York, N. Y., U. S.

## PERFUME EXTRACTS.

*Report.*—Commended for the excellent quality of their perfume extracts, exhibited in a large and varied series, and for which they have established an important business.

## 511. Colgate &amp; Co., New York, N. Y., U. S.

## FANCY SOAPS AND PERFUMERY.

*Report.*—Commended for the quality of their articles, including their common soaps.

## 512. J. W. Colton, Westfield, Mass., U. S.

## FRUIT FLAVORS AND PERFUMES.

*Report.*—Commended for the excellency of his fruit flavors, which are manufactured by him in large quantities and of pure material.

## 513. Lorenz Brothers, Toledo, Ohio, U. S.

## TOILET ARTICLES AND POMADES.

*Report.*—These articles are compounded with great care and of very excellent material, their odors retaining in a very excellent manner their original character until they have entirely disappeared.

## 514. Arthur Fricke, Philadelphia, Pa., U. S.

## PERFUMERY.

*Report.*—Commended for the excellent quality of extracts, pomades, hair-dye, and shaving-cream.

**515. Julião de Castro & Son, Campos, Rio de Janeiro, Brazil.****SUGAR.**

*Report.*—Commended for a series of samples of sugar exhibited, open-pan, vacuum-pan, and refined; all of superior quality, especially that made by the vacuum-pan process.

**516. J. Wiehe, Mauritius.****SUGAR.**

*Report.*—Commended for good quality of several samples of crystallized and vesou sugar, also of some bright yellow soft sugar.

**517. Government Botanical Gardens, Kingston, Jamaica.****RAW SUGAR.**

*Report.*—Commended for bright, clear products of open-pan boiling from Bog estate (Ernest Elliott), Jamaica.

**518. State Government of Yucatan, City of Merida, Mexico.****SUGAR.**

*Report.*—Commended for the excellent character of Muscovado sugar shown, very light in color, almost white, a very good product obtained directly from cane-juice.

**519. H. H. Prince Mangkoe Negoro, Soorakarta, Java, East Indies.****SUGAR.**

*Report.*—Commended for excellent quality of form and centrifugal sugar shown, clean and of good grain.

**520. Commission for the Province of Pernambuco, Brazil.****SUGAR.**

*Report.*—Commended for the excellence of samples shown of vacuum-pan centrifugal sugar, of specially fine quality.

**521. C. Say, Paris, France.****REFINED SUGARS.**

*Report.*—Commended for very beautiful samples of refined sugar of large grain and perfect quality, especially intended for English consumption, and of fine-grained sugars.

**522. Colonial Sugar Refining Co., Sydney, New South Wales, Australia.****REFINED SUGARS.**

*Report.*—Commended for general excellence of crystallized sugars produced upon a large scale.

**523. Colonial Co. (Limited), Trinidad.****SUGAR.**

*Report.*—Commended for the good quality of crystallized sugar from St. Madeleine factory.

**524. V. Demeulemeester, Ghent, Belgium.****SUGAR CANDY.**

*Report.*—The sugar candy contributed by this exhibitor is of excellent quality, and employed on a large scale in the manufacture of French wines of Champagne.

**525. San Carlos Estate, Yantepec District, State of Morelas, Mexico.**

SUGAR.

*Report.*—Commended for the good quality of raw sugar (clayed) from crystallizing cones, of light color, and well and uniformly drained.

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**526. Faustino Goribar, Casasano, State of Morelas, Mexico.**

SUGAR.

*Report.*—Commended for the good quality of clayed raw sugar from cones, hard and well drained, good grain.

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**527. Barron & Co., City of Mexico, Mexico.**

SUGAR.

*Report.*—Commended for the excellence of form sugar, very white and of sharp clean grain.

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**528. Francisco Torrent, Granada, Spain.**

SUGAR.

*Report.*—Commended as a very creditable display of centrifugal sugar, boiled in the vacuum-pan, represented by specimens in various stages of draining, the product of sugar-cane cultivated in peninsular Spain.

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**529. Catalina Lorenzo, Pampanga, Philippine Islands.**

SUGAR.

*Report.*—Commended for the exhibition of excellent, very nearly white, raw sugar, made in the common open pan, as also of a dark, heavy sugar chiefly sold to the (Malayan) natives.

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**530. E. Menier, Paris, France.**

SUGAR.

*Report.*—Commended for the excellent quality of refined beet-root sugar (centrifugal) exhibited, this sugar being produced upon a very large scale, and independently of the manufacture of chocolate, for which a part of it is used.

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**531. Alfred Solf & Co., Chiclayo, Lima, Peru.**

SUGAR.

*Report.*—Commended for the good quality of sugars, especially centrifugal.

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**532. José Puig, Pampanga, Philippine Islands.**

SUGAR.

*Report.*—This exhibitor sends a good specimen of medium brown sugar for refiners' use, such as is extensively and profitably shipped to England.

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**533. A. Schörke, Görlitz, Germany.**

GRAPE SUGAR.

*Report.*—Commended for the hardness and light color of the large masses of starch sugar, and the fine condition of nearly chemically pure grape sugar shown.

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534. **Emilia Samá de García Muñoz, Havana, Cuba.**

SUGAR.

*Report.*—Commended for the remarkably fine quality of beautifully white sugar, imitating refined, made directly from cane-juice at a single boiling, using animal charcoal; shown in blocks from the crystallizing forms, and crushed.

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535. **Marquis of Cabo Caribe, Porto Rico.**

SUGAR.

*Report.*—Commended for the general excellence of a series of samples of centrifugal sugar; one, very fine, white, and hard, is especially deserving of notice.

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536. **Baron de Villa Franca Quissama, Rio de Janeiro, Brazil.**

SUGAR.

*Report.*—Commended for the excellent quality of white (raw; clayed) sugar from crystallizing cones.

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537. **Sergio & Co., Bahia, Brazil.**

SUGAR.

*Report.*—Commended for the excellence of very white centrifugal sugar contributed.

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538. **Lyman & Cyrus Judd, South Strafford, Vt., U. S.**

SUGAR.

*Report.*—The maple sugar exhibited, both in the form of soft granular sugar and in cakes, is of light color and well drained, yet retains the peculiar flavor of the maple, which is considered desirable by its consumers.

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539. **José E. Pires Portella, Pernambuco, Brazil.**

SUGAR.

*Report.*—Commended for the high character of blocks of (raw; clayed) sugar from crystallizers exhibited, of hard and sharp grain and light color, nearly white, representing extensive production and large export.

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540. **Viscount of Mauá, Rio de Janeiro, Brazil.**

SUGAR.

*Report.*—Commended for the excellent quality of crystallized raw sugar, of sharp, clean grain and very light color, produced upon a large scale.

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541. **Mansell, Carré, & Co., Rio de Janeiro, Brazil.**

SUGAR.

*Report.*—Commended for the exhibition of a remarkably fine, sharply crystallized specimen of vacuum-pan centrifugal sugar, representing extensive export to England.

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542. **Colonial Department, Hague, Netherlands.**

SUGAR, INDIGO, AND OTHER PRODUCTS OF JAVA.

*Report.*—Commended for the exhibition of an important and instructive collection of sugars (Muscovado, clayed, and centrifugal), indigo, vegetable wax and vegetable tallow, oils, and resins, chiefly from Java, but in part from other of the great islands of the Dutch East Indies.



**543. Imperial Maritime Customs of China.****SUGAR.**

*Report.*—Commended for the exhibition of an instructive collection of forty-six samples of various kinds of sugar produced in the Chinese Empire, and exported from Foochow, Swatow, Amoy, Takow, Tamsui, and Canton.

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**544. Frederic Keshner, St. Petersburg, Russia.****SUGAR.**

*Report.*—Commended for the excellent quality of beet-root sugar in refined loaves of medium grain. This exhibitor shows loaves of ordinary size, and also others made especially small for export to Persia and China. His establishment refines only.

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**545. Ostrow Sugar Manufacturing Co., Warsaw, Russia.****SUGAR.**

*Report.*—Commended for the excellent character of refined beet-root sugar in loaves, of fine grain, clean, sharp, and hard, produced upon a large scale.

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**546. Prince Victor Golitzyn, Slavgorod, Kharkof, Russia.****SUGAR.**

*Report.*—Commended for the centrifugal sugar exhibited, made directly from the beet-root, which is of very good character, sharp grain, of medium fineness, clean, and well drained.

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**547. Plantation "Ogle," British Guiana.****SUGAR.**

*Report.*—Commended for the excellent quality and condition of samples of vacuum-pan sugar.

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**548. Mendez & Keller, Tucuman, Argentine Republic.****SUGAR.**

*Report.*—Commended for the light color and good grain of crude sugar, presumably made by ordinary open-pan boiling.

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**549. Plantation "La Bonne Intention," British Guiana.****SUGAR.**

*Report.*—Commended for the fine quality and condition of crystallized sugar made in the vacuum-pan, and also more especially that produced by the maceration process.

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**550. Plantation "Leonora," British Guiana.****SUGAR.**

*Report.*—Commended for excellence of results obtained by the maceration process.

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**551. Plantation "Great Diamond," British Guiana.****SUGAR.**

*Report.*—Commended for the excellent character of crystallized sugar made by vacuum-pan boiling.

## 552. J. E. Davidson, Alexandra Plantation, Mackay, Queensland, Australia.

RAW SUGAR.

*Report.*—An excellent exhibit of a very dry, almost white, coarse-grained, rich, raw sugar, obtained by evaporation in an open pan. Commended for excellence in manipulation and product.

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## 553. A. H. Brown, Maryborough, Queensland, Australia.

RAW SUGAR.

*Report.*—The raw sugar obtained by evaporation in vacuum-pans is almost white, of good, fine grain, and rich and excellent quality. Commended for excellence of product.

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## 554. Fryar &amp; Strachan, Loganholm, Queensland, Australia.

RAW SUGAR.

*Report.*—A very fine, rich, coarse-grained, yellowish-white, dry, raw sugar. Commended for excellence of product.

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## 555. Prince Victor Vassiltchikoff, Troobetschino, Tambow, Russia.

SUGAR.

*Report.*—Commended for the very admirable character of centrifugal sugar, direct from beet-root without refining, very white, clean, and sharp-grained. This exhibitor produces centrifugal sugar exclusively.

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## 556. Krasinec Sugar Works, Plock, Russia.

SUGAR.

*Report.*—Commended for excellence of refined beet-root sugar exhibited, of hard, sharp grain, translucent and almost colorless, with use of very little ultramarine.

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## 557. John Kharitonenko, Soomy, Kharkof, Russia.

SUGAR.

*Report.*—Commended for excellence of refined loaves of beet-root sugar shown, white, close-grained, well and uniformly drained.

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## 558. Basil Tarnovsky, Parafievka, Tchernigov, Russia.

SUGAR.

*Report.*—The beet-root sugar (centrifugal, unrefined) which this exhibitor presents is very beautiful, in large, sharp, clean, and transparent grains.

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## 559. Soboлевski Sugar Mill (Richard Kümens, Manager), Podolia, Russia.

SUGAR.

*Report.*—Commended for display of refined beet-root sugar of great excellence, close, beautifully-white grain, commanding a price a little above the ordinary market.

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## 560. Charles von Meck (Brailof Sugar Mill), Podolia, Russia.

SUGAR.

*Report.*—Commended for the excellence of refined beet-root sugar exhibited. This sugar, in loaves, is very white, close-grained, and uniformly drained.

**561. Młodzescin Sugar Mills (Protovsky, Manager), Warsaw, Russia.**

SUGAR.

*Report.*—Commended for the admirable display of refined beet-root sugar,—in loaves, cake as removed from centrifugal machine, and pulverized,—beautifully clean, well drained, and hard.

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**562. N. Mayzner (Lanenta & Tsabelin Sugar Mills), Warsaw, Russia.**

SUGAR.

*Report.*—Commended for the excellent display of centrifugal beet-root sugar (both raw and refined), in large and fine grain, all of superior quality.

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**563. Leonow Sugar Manufacturing Co. (Ianash, Manager), Warsaw, Russia.**

SUGAR.

*Report.*—The refined beet-root sugar in loaves exhibited by this company is of very superior character, fine-grained, white, and well drained and dried.

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**564. Lysckowice Sugar Manufacturing Co. (M. Epstein, Manager), Warsaw, Russia.**

SUGAR.

*Report.*—Commended for great excellence of refined beet-root sugar in loaves, of sharp, large grain, very hard and highly translucent, to suit Russian market and the habit of placing a lump of sugar in the mouth when drinking tea.

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**565. Iosefow Sugar Manufacturing Co. (Iarash, Manager), Warsaw, Russia.**

SUGAR.

*Report.*—Commended for excellence of refined beet-root sugar exhibited,—very white, close, and moderately fine-grained,—the loaves turned off on the outside in a lathe.

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**566. Hermanow Sugar Manufacturing Co. (Epstein, Manager), Warsaw, Russia.**

SUGAR.

*Report.*—Commended as an exhibition of refined beet-root sugar of unusual excellence, fine-grained, white, translucent, uniform in grain, thoroughly well drained and dried; so hard and compact as to ring almost like iron when struck; produced upon a very large scale.

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**567. Gnevan Sugar Manufacturing Co., Podolia, Russia.**

SUGAR.

*Report.*—Commended for the excellent character of refined loaf sugar from beet-root exhibited; good grain, of medium coarseness, and well and uniformly drained. This company refines only.

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**568. Joorinski Sugar Mill, Podolia, Russia.**

SUGAR.

*Report.*—Commended for the remarkably fine character of centrifugal (unrefined) beet-root sugar, shown in very large and also in small crystals, beautifully sharp, clean, and colorless. The excellent treatment of the juice is well illustrated by a large sample of the moist mass as put into the centrifugal machine, this mass being as a whole almost colorless.

**569. I. M. Brodski, Kief, Russia.**

SUGAR.

*Report.*—Commended for the excellent quality of refined beet-root sugar exhibited in loaf form, sharp, clean grain, and very hard.

---

**570. Francisco de Paula Gomez Barroso, Campos, Rio de Janeiro, Brazil.**

SUGAR.

*Report.*—Commended for the exhibition of samples of light-brown sugar of staple character for export, made by common open-pan process; of fine quality.

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**571. C. H. Rosenstiel (Freeport Beet Sugar Factory), Freeport, Ill., U. S.**

SUGAR.

*Report.*—Commended for the exhibition of beet-root sugar of different grades, viz., refined in loaf, clear, rather small-grained centrifugal crystals, and light-colored soft sugar as third product; all of creditable quality, and interesting as illustrating the attempt to establish the beet-root sugar industry in the United States.

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**572. Paulo F. da Costa Vianna, Campos, Rio de Janeiro, Brazil.**

SUGAR.

*Report.*—Commended for a display of raw sugars of superior character made by second boiling of molasses.

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**573. Alphonso M. Desincourt, Pará, Brazil.**

SUGAR.

*Report.*—Commended as an exhibition of very superior (raw, clayed) sugar from crystallizing cones, of good grain and light color.

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**574. Manoel de Souza Leão, Pernambuco, Brazil.**

SUGAR.

*Report.*—Commended for the exhibition of several samples of soft sugar of excellent character and light color.

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**575. Buena & Co., Havana, Cuba.**

SUGAR.

*Report.*—Commended for the excellent quality of centrifugal (light yellow) sugar exhibited, in large, sharp, crystalline grains.

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**576. Francisca A. Bartlett de Oviedo, Havana, Cuba.**

SUGAR.

*Report.*—The bright and light yellow centrifugal sugars shown are large-grained, sharp, clean, and well crystallized, of superior quality.

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**577. Julian de Zulueta, Havana, Cuba.**

SUGAR.

*Report.*—Commended for the admirable quality of white sugar made directly from cane-juice with the aid of animal charcoal. One of the three samples shown is in solid cakes, almost to be taken for refined sugar.

## 578. Juan Poey, Havana, Cuba.

## SUGAR.

*Report.*—Commended for the exhibition of a remarkably fine series of white sugars of the highest character, produced directly from cane-juice, with use of animal charcoal and vacuum-pan for final evaporation. The result is admirable, and almost equal to that of the refining process. The great scale of production on this important estate, the extensive use upon it of manure, and the exact statistics accompanying the exhibit, serve to greatly increase its interest.

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## 579. Leoncia Sasatin, Pampanga, Philippine Islands.

## SUGAR.

*Report.*—Commended for the exhibition of samples of crude sugar made by common open-pan process, valuable for refiners' use; one soft, light colored, but well crystallized; the others dark, but of good characteristic odor.

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## 580. Ramon Argoncillo, Batangas, Philippine Islands.

## SUGAR.

*Report.*—Commended for the excellent quality of samples exhibited of bright, light yellow sugar, of sharp, clean grain.

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## 581. Julian Buison, Pampanga, Philippine Islands.

## SUGAR.

*Report.*—Commended for the exhibition of a series of samples of crude sugar of different grades, and representing an important trade with England.

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## 582. Manuel Sirer, Tarlac, Philippine Islands.

## SUGAR.

*Report.*—A single sample exhibited of very white and well crystallized raw sugar deserves special attention as an admirable result of common open-pan boiling.

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## 583. Arnheim Beet-Root Sugar Manufactory, Arnheim, Netherlands.

## SUGAR.

*Report.*—Commended for the excellent quality of centrifugal sugar, of high polarization standard, made directly from beet-root, in large, sharp, colorless crystals, accompanied by second and third grades of soft, light-brown sugar.

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## 584. James Makee, Ulupalakua, Maui, Hawaiian Islands.

## SUGAR.

*Report.*—Commended for the very handsome character of white (washed) sugar made directly from cane-juice with the aid of the vacuum-pan and drained in the centrifugal machine.

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## 585. Widdeman &amp; Harris, Waihee Plantation, Maui, Hawaiian Islands.

## SUGAR.

*Report.*—Commended for the excellent quality of vacuum-pan, unwashed, centrifugal sugar (coffee sugar). Two samples shown, both of first boiling, very good, sharp, bright grain, with a little difference in drainage.

**586. Lihue Plantation Co., Kauai, Hawaiian Islands.**

SUGAR.

*Report.*—Commended for the very good quality of bright, vacuum-pan centrifugal sugar, of good though not very large grain, unwashed.

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**587. Hitchcock Brothers, Hilo, Hawaii, Hawaiian Islands.**

SUGAR.

*Report.*—Commended for the excellence of two samples of open-pan sugar, the second (Muscovado) representing a desirable sugar for refiners' use, while the former is a handsome specimen of light-colored soft sugar from first boiling.

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**588. Campbell & Turton, Lahaina, Maui, Hawaiian Islands.**

SUGAR.

*Report.*—Commended for the superior character of their centrifugal sugars shown, all produced directly from cane-juice; No. 1 and No. 2 being the product of the first boiling, washed and unwashed, and No. 3, the Muscovado sugar, from second boiling of molasses. No. 1 is not of very large grain, but bright, sharp, and handsome in more than usual degree.

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**589. W. H. Bailey, Wailuku, Maui, Hawaiian Islands.**

SUGAR.

*Report.*—Commended for the good quality of soft, bright (coffee) sugar, and of dark refining sugar from second boiling.

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**590. Carlo Erba, Milan, Italy.**

SUGAR.

*Report.*—Commended for the very creditable character of light-brown soft sugar, of good grain, made from sorghum cane upon a commercial scale.

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**591. J. H. Hamlen & Son, Portland, Me., U. S., for C. Meugniot & S. A. Duchassing Son.**

SUGAR.

*Report.*—Commended for the good quality of their samples of centrifugal sugar, made, in three runs respectively, directly from cane of Le Moule plantation and factory in the island of Guadeloupe.

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**592. Daïra of the Viceroy of Egypt, Egypt.**

SUGAR.

*Report.*—Refined loaf and centrifugal sugars of very superior quality are shown as the product of thirteen extensive factories in Upper Egypt. Of the machinery in these factories an interesting series of photographs is exhibited.

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**593. Provincial Board of Mindanao, Philippine Islands.**

SUGAR.

*Report.*—A dark sugar, well fitted for refining purposes, and of low price, is sent as the product of a portion of the large island of Mindanao, and deserves credit as evidence of colonizing efforts.

## 594. Provincial Board of Antique, Philippine Islands.

## SUGAR.

*Report.*—Commended for the very good quality and low price of a crude sugar, which is produced in an island of the Philippine group as yet but thinly settled; the exhibit consequently representing colonial enterprise.

## 595. Kief Section of the Imperial Technical Society of Russia, Kief, Russia.

## SUGAR.

*Report.*—Commended for a collective exhibition of refined beet-root sugar of admirable quality, and produced upon a very large scale in the south of Russia.

## 596. John McDonald, Supt. Government Penal Establishment, St. Helena, Queensland, Australia.

## RAW SUGAR.

*Report.*—A yellowish-white raw sugar, of good grain and richness, obtained by evaporation in an open pan, which shows great skill in manipulation. Commended for excellence of product.

## 597. Blymyer Manufacturing Co., Cincinnati, Ohio, U. S.

## MACHINERY FOR SUGAR PRODUCTION.

*Report.*—Commended for design and workmanship of several mills of medium and small sizes for crushing sorghum and sugar cane, and evaporating pans, fixed and rocking, for treatment of sorghum-juice.

## 598. Mirlees, Tait, &amp; Watson, Glasgow, Scotland.

## SUGAR-MAKING MACHINERY (IN MOTION).

*Report.*—Commended for an important and in many respects admirable exhibit. Amongst the principal points claiming attention and deserving praise are the following: In large cane-crushing mill; judicious construction of ribbed tubular arms and rim of large spur wheel; breadth and truth of bearing of teeth of heavy gearing; position of lower rollers to prevent choking and diminish lateral strain on cheeks; detached cheek-pieces to allow of horizontal removal of lower rollers; attachment of scraping blade to movable cheek-piece instead of to main frame, thus preserving close bearing of edge to roller even under heavy strain. In small cane-crushing mill, great compactness, simplicity, and cheapness. In centrifugal hydro-extractors (large and small), the replacement of double fixed bearings by a special form of single bearing, admitting a small amount of play of the axis, and producing rotation about centre of gravity of basket, even though unequally charged round its circumference; also the ease and smoothness of starting due to peculiar form of fast and loose pulley arm used. In vacuum pump, the absence of piston packing, and peculiar disposition of valves which enables the pump to draw both air and water (no Torricellian tube needed), while the piston is in contact with water only.

## 599. Colwell &amp; Brother, New York, N. Y., U. S.

## VACUUM-PAN FOR SUGAR BOILING.

*Report.*—Commended for good general design of the vacuum-pan itself and its various accessories, especially the provision for moving the cane-juice and boiled syrup entirely by atmospheric pressure and gravity, and for good sound workmanship in construction of same.

**600. S. S. Hepworth, New York, N. Y., U. S.****CENTRIFUGAL MACHINES FOR DRAINING SUGAR.**

*Report.*—The set of four centrifugal machines exhibited presents the characteristics of good general design and workmanlike construction, with some special features in detail worthy of commendation, of which the chief are the mode of driving from below with single bearing, freedom of space around revolving basket, and convenient disposition of openings for discharge of sugar.

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**601. H. W. & R. Lafferty, Gloucester, N. J., U. S.****CENTRIFUGAL MACHINES FOR DRAINING SUGAR.**

*Report.*—Commended for the exhibition of a set of four centrifugal machines, with trough and revolving knives to reduce lumps in mass,—outside walls of baskets of corrugated copper,—the whole substantially and well made. Also a screw elevator for the soft sugar mass, embodying an original and useful form of valve, or cut-off, to prevent return of the mass and render action continuous.

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**602. Jos. H. Adams & Son, Peekskill Manufacturing Co., New York, N. Y., U. S.****SUGAR MILLS.**

*Report.*—Commended for the simplicity and strength of small crushing mills, to be used in extracting juice from sorghum or sugar-cane.

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**603. Robert Hutter, Philadelphia, Pa., U. S.****STARCH SUGAR AND GLUCOSE.**

*Report.*—Commended for the good quality of solid starch sugar and thick syrupy glucose exhibited.

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**604. Antheaume & Son, Bourget near Paris, France.****GLUCOSE AND CARAMEL.**

*Report.*—Commended for the good quality and handsome condition of syrupy glucose and caramel exhibited.

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**605. Van Tilvoorde, Vollenhove, Netherlands.****GLUCOSE SYRUP.**

*Report.*—This firm exhibits glucose in the form of a very thick, almost solid, syrup, of great cleanness and transparency.

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**606. E. M. Dexter & Co., Philadelphia, Pa., U. S.****CONFECTIONERY.**

*Report.*—Commended for artistic taste in designing ornamental confectionery for table use.

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**607. George Miller & Sons, Philadelphia, Pa., U. S.****CONFECTIONERY.**

*Report.*—Commended for superior quality of confectionery and gum drops.

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**608. G. Byron Morse, Philadelphia, Pa., U. S.****CONFECTIONERY.**

*Report.*—Commended for fine fancy cakes classed as confectionery, and for good taste in designs for ornamental confectionery.



**609. J. J. Richardson & Co., Philadelphia, Pa., U. S.****BONBONS OF SUGAR.**

*Report.*—Commended for exhibition of a good general assortment of candy and comfits, of good materials, and well and neatly made.

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**610. Schall & Co., New York, N. Y., U. S.****ORNAMENTAL CONFECTIONERY.**

*Report.*—Commended for artistic merit in their designs for the decoration of ornamental cakes, and for the superior manner in which their figures are mounted in a composition of their own invention.

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**611. Stollwerk Brothers, Cologne, Germany.****CONFECTIONERY.**

*Report.*—Commended for the exhibition of a very fine and varied collection of bonbons and confectionery, with samples of sugar and other materials used. Much taste and ingenuity are shown in the forms produced, and the articles appear to be quite pure and free from injurious coloring materials.

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**612. Herman H. Geilfuss, Philadelphia, Pa., U. S.****CONFECTIONERY.**

*Report.*—Commended for an admirable display of a whole line of sugar toys, animals, crystal toys, brilliants, penny toys, roses and flowers of sugar; also basket figures and hollow crystal eggs.

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**613. Paul Chenu, Paris, France.****CONFECTIONERY.**

*Report.*—This house exhibits bonbons of various kinds, from pure materials, prepared with much skill and taste, free from injurious coloring substances, and commanding a high price.

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**614. Koodriavzef Brothers, Moscow, Russia.****BONBONS OF SUGAR.**

*Report.*—Commended for excellence of candy, pastilles, and other bonbons of sugar exhibited.

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**615. Wm. Hessin, Toronto, Ontario, Canada.****BONBONS OF SUGAR.**

*Report.*—The exhibitor presents a good general assortment of well-made bonbons, comfits, and lozenges, displaying both taste and skill.

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**616. Biddell Brothers, Sydney, New South Wales, Australia.****CONFECTIONERY OF SUGAR.**

*Report.*—Commended for the exhibition of a good assortment of bonbons, of pure material and neatly prepared, from colonial sugar.

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**617. Fred'k Allen & Sons, London, England.****BONBONS OF SUGAR.**

*Report.*—Commended for the exhibition of a varied collection of nicely prepared bonbons and lozenges, in excellent condition.

**618. Stephen F. Whitman & Son, Philadelphia, Pa., U. S.**

## CONFECTIONERY.

*Report.*—Commended for a superior quality of fine grade confectionery, remarkable in purity and excellent in flavor. The artistic manner in which the goods are prepared for the market is worthy of the highest commendation.

**619. Wiltbank & Scattergood, Philadelphia, Pa., U. S.**

## CONFECTIONERY.

*Report.*—Commended for an admirable display of plain stick candy, fancy cut lumps, and cakes with figures and mottoes, made by hand of the best materials, and sold at low rates.

**620. Dudley L. Page, Philadelphia, Pa., U. S.**

## PLAIN CANDY.

*Report.*—Commended for an excellent quality of plain candy.

**621. Henry Maillard, New York, N. Y., U. S.**

## CONFECTIONERY.

*Report.*—Commended for an exhibition of fancy and ornamental confectionery of great delicacy of color, elegance of finish, and purity of materials; for a remarkable display of gum drops, lozenges, pan-work, chocolate bonbons, cordial and jelly drops, as well as of an extensive line of cheap confectionery.

**622. F. Laurent, Philadelphia, Pa., U. S.**

## CONFECTIONERY.

*Report.*—Commended for good taste in the ornamentation of cakes by means of fancy confectionery, and for use of pure materials.

**623. Greenfield & Strauss, New York, N. Y., U. S.**

## CONFECTIONERY.

*Report.*—Commended for an extensive line of vegetable colors, which the firm manufactures for itself and the trade; for an excellent quality of wintergreen oil; for an extraordinary display of lozenges of every description, uniform in size, appearance, and purity, made by machinery invented and patented by this house; for a rare display of pan-work, gum work, stick candy for Southern trade; for toy candies and a great variety of bonbons—all of the articles exhibited being worthy of the highest commendation.

**624. Croft, Wilbur, & Co., Philadelphia, Pa., U. S.**

## CONFECTIONERY.

*Report.*—Commended for superior finish, delicacy of colors, and purity of goods; for extensive variety and excellence of dragée work, and for the artistic manner in which all of their confectionery is prepared for the market.

**625. Chase & Co., Boston, Mass., U. S.**

## CONFECTIONERY.

*Report.*—A large, varied, and handsome exhibit of candies, comfits, and lozenges of very creditable quality, and handsomely displayed.

**626. J. P. Anderson, Philadelphia, Pa., U. S.**

CANDY SLICER, AND COCOANUT GRATER.

*Report.*—Commended for simplicity and effectiveness of design and excellence of workmanship of machine for slicing candy.

**627. Mrs. John Gardner, Philadelphia, Pa., U. S.**

CONFECTIONERY MACHINES.

*Report.*—Commended for valuable confectionery machines, simple in construction, practical in operation, and accomplishing their work with economy and dispatch.

**628. Thomas Mills & Brother, Philadelphia, Pa., U. S.**

CONFECTIONERS' MACHINE TOOLS.

*Report.*—This firm makes the production of this class of machine tools a specialty, and exhibits a large and varied assortment of machines characterized by ingenuity of construction for their special uses, and excellence of workmanship and finish.

**629. Luke Collier, Rochdale, England.**

CONFECTIONERS' MACHINE TOOLS.

*Report.*—Commended for the simplicity of construction and solidity of workmanship of machines for forming boiled sugar into variously shaped bonbons.

**630. Stefano Berte, Alessandria, Italy.**

MACHINE FOR MAKING BONBONS.

*Report.*—Commended for simplicity and effectiveness of machine, shown at work, for making bonbon drops or pastilles.

**631. Vojtechovsky & Reznicek, Prague, Austria.**

MACHINES FOR MOULDING SUGAR BONBONS.

*Report.*—Commended for the exhibition of several forms of machine for moulding figures of animals and other objects in sugar. The largest machine is deserving of praise for the simple and ingenious arrangement for discharging the moulded bonbons.

**632. Auguste Landrin, Paris, France.**

VEGETABLE COLORS FOR CONFECTIONERS' USE.

*Report.*—Commended for a handsome display of vegetable (non-poisonous) coloring materials intended for use in the manufacture of bonbons. The brilliancy and variety of the colors are quite satisfactory.

**633. Pedro Sirvent & Oliver, Reus, Tarragona, Spain.**

ALCOHOL.

*Report.*—Commended for the excellent quality of strong alcohol produced from wine at a single distillation; scarcely a trace of special odor retained.

**634. Fermin de Urmeneta, Chiclana, Cadiz, Spain.**

ALCOHOL.

*Report.*—Commended for the strength and purity of rectified alcohol from wine.

## 635. Van Dulken, Weiland, &amp; Co., Rotterdam, Netherlands.

ALCOHOL.

*Report.*—Commended for the good quality of alcohol from grain, strong and well purified from fusel oil.

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## 636. Gimenez de Tejada Brothers, Moguer, Huelva, Spain.

ALCOHOL.

*Report.*—Commended for the excellent quality of rectified alcohol, strong and free from fusel oil, made from wine.

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## 637. Francisco Dominguez Bollullos del Condado, Huelva, Spain.

ALCOHOL.

*Report.*—Commended for the exhibition of strong alcohol of great purity, and almost entirely free from special odor, made from wine.

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## 638. Inchausti &amp; Co., Manila, Philippine Islands.

ALCOHOL.

*Report.*—Commended for the strength and purity of alcohol manufactured on a large scale from the nipa.

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## 639. L. Soler &amp; Co., Cardenas, Cuba.

ALCOHOL.

*Report.*—Commended for the excellent quality of alcohol manufactured from sugar-cane rum, strong and free from special odor.

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## 640. D. Antonio Gomez de Carvalho Barroso, Campos, Rio de Janeiro, Brazil.

ALCOHOL.

*Report.*—Commended for the excellence of rectified alcohol from rum exhibited, the same being of high degree of strength and free from special odor of the cane.

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## 641. Nicolas Gomez Gonzalez, Huelva, Spain.

ALCOHOL.

*Report.*—Commended for the purity and strength of rectified alcohol from wine.

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## 642. Antonio Flores, Moguer, Huelva, Spain.

ALCOHOL.

*Report.*—Commended for the good quality of strong alcohol manufactured from wine.

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## 643. J. C. Van Marken, Jr., Delft, Netherlands.

ALCOHOL.

*Report.*—Commended for the good quality and purity of rectified spirit from grain exhibited along with the materials for its production; fusel oil and maize oil.

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## 644. G. W. Middleton &amp; Co., Philadelphia, Pa., U. S.

RECTIFIED SPIRITS.

*Report.*—Commended for strength and purity of rectified spirit exhibited, especially the freedom from disagreeably smelling higher alcohols of "cologne spirit" for perfumers' use.

## 645. E. Malligand, Paris, France.

## ALCOHOLOMETER.

*Report.*—Commended for improved form of ebullioscope, by use of which the proportion of alcohol in wines is determined with great accuracy and rapidity.

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## 646. Pauly, Bouthon, &amp; Co., Vianden, Grand Duchy of Luxemburg.

## VINEGAR.

*Report.*—Commended for the excellent quality of highly concentrated vinegars, admitting of large dilution with water for use.

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## 647. A. F. W. Bodin &amp; Co., Milwaukee, Wis., U. S.

## VINEGAR.

*Report.*—Commended for the good quality of vinegar exhibited.

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## 648. Maille &amp; Tandeau, Paris, France.

## VINEGAR.

*Report.*—This house exhibits excellent wine vinegar, and also, as a specialty, vinegars infused upon aromatic herbs (*aux fines herbes* and *aux truffes*) of delicious odor and taste. These latter well deserve special attention.

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## 649. Antonio Albi &amp; Ginez, Alicante, Spain.

## VINEGAR.

*Report.*—Commended for the remarkably fine quality of strong, dark-colored vinegar, made from Muscatel wine in 1860, of high, aromatic flavor.

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## 650. C. Schulman &amp; Co., Rio de Janeiro, Brazil.

## VINEGAR.

*Report.*—Commended for the good character of the (red and white) vinegar exhibited, produced in quantity from the sugar-cane (residues of manufacture of rum).

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## 651. Scheierman &amp; Co., Riga, Russia.

## CONCENTRATED VINEGAR.

*Report.*—Commended for good quality of very strong vinegar exhibited.

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## 652. Crosse &amp; Blackwell, London, England.

## VINEGAR.

*Report.*—The malt vinegar exhibited by this firm, both brown and distilled, is of superior quality and in fine condition. It deserves particular notice, both for table use and still more for pickling, for which latter purpose it is largely employed by the exhibitors.

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## 653. Henry Reed &amp; Co., South Yarra, Victoria, Australia.

## VINEGAR.

*Report.*—Commended for the good quality of higher grades of vinegar exhibited.

## 654. O. V. Troop &amp; Co., St. John, New Brunswick.

VINEGAR.

*Report.*—Commended for the good quality and cheapness of vinegar exhibited.

## 655. Michael Le Fevre, Montreal, Canada.

VINEGAR.

*Report.*—Commended for the good quality of vinegar exhibited, produced in quantity at moderate price.

## 656. Dr. Alipio Leitão, Penacova, Coimbra, Portugal.

VINEGAR.

*Report.*—Commended for the extremely high quality and delicate flavor of red wine vinegar contributed.

## 657. Francisco Garcia de Carvalho, Arganil, Coimbra, Portugal.

VINEGAR.

*Report.*—Commended for the good quality of strong red wine vinegar exhibited.

## 658. João de Britto &amp; Sons, Lisbon, Portugal.

VINEGAR.

*Report.*—Commended for the good quality of strong red and white wine vinegars placed on exhibition.

## 659. João Antonio Ribeiro, Portalegre, Portugal.

VINEGAR.

*Report.*—Commended for the very good character of cheap wine vinegar shown.

## 660. Balthazar Perez Ramirez, Evora, Portugal.

VINEGAR.

*Report.*—Commended for the excellence of white wine vinegar produced at a moderate price.

## 661. Jose Paulo de Mira, Evora, Portugal.

VINEGAR.

*Report.*—Commended for the very good quality of light red wine vinegar of low price.

## 662. Joaquim Antonio Simoes, Figueira, Coimbra, Portugal.

VINEGAR.

*Report.*—Commended for the good quality of red and white wine vinegar exhibited.

## 663. Francisco A. do Amaral Guerra, Coimbra, Portugal.

VINEGAR.

*Report.*—Commended for the fine flavor of strong, dark-colored wine vinegar shown.

## 664. Bernardino Jose de Mello Souza, Penafiel, Porto, Portugal.

VINEGAR.

*Report.*—Commended for the excellent quality and vinous flavor of cheap, dark red wine vinegar exhibited.

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## 665. Viscount of Esperança, Cuba, Beja, Portugal.

VINEGAR.

*Report.*—Commended for the excellent quality and high flavor of white wine vinegar sold at a low price.

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## 666. Antonio Candido Nunes, Elvas, Portalegre, Portugal.

VINEGAR.

*Report.*—Commended for the delicacy of flavor of white wine vinegar exhibited.

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## 667. Maria do Carmo Franciose, Cartaxo, Santarem, Portugal.

VINEGAR.

*Report.*—Commended for the good character and flavor of red wine vinegar on exhibition.

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## 668. Maria José Larcher, Portalegre, Portugal.

VINEGAR.

*Report.*—Commended for the good quality of wine vinegar produced at a moderate price.

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## 669. Domingos Affonso Almada, Lisbon, Portugal.

VINEGAR.

*Report.*—Commended for the very high quality of strong red and white wine vinegars shown. The fine flavor of the red vinegar is especially worthy of praise.

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## 670. João da Fonseca Achaiole, Portalegre, Portugal.

VINEGAR.

*Report.*—Commended for the strength and good flavor of wine vinegar produced at very moderate price.

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## 671. Royal Wine Co. of Alto Douro, Oporto, Portugal.

VINEGAR.

*Report.*—Commended for the exhibition of several wine vinegars (red and white), all of them of good and some of unusually excellent quality.

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## 672. Widow and Sons of A. Estève, Reus, Tarragona, Spain.

VINEGAR.

*Report.*—Commended for the production at a low price of wine vinegar of very good quality and flavor.

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## 673. Jaime Ferrer, Alicante, Spain.

VINEGAR.

*Report.*—Commended for the good quality of very light colored, clear, well-flavored wine vinegar, sold at a low price.

**674. Juan Gatell & Folch, Altafulla, Tarragona, Spain.**

VINEGAR.

*Report.*—Commended for the excellent flavor of white wine vinegar on exhibition.**675. Eduardo Hidalgo & Berjano, San Lucar, Cadiz, Spain.**

VINEGAR.

*Report.*—Commended for the excellence of very old wine vinegar shown, of dark orange-brown color, strong, and high-flavored.**676. Constantino de la Huerta, Seville, Spain.**

VINEGAR.

*Report.*—Commended for fine vinous flavor of white wine vinegar of medium strength.**677. José Montagut Illa, Reus, Tarragona, Spain.**

VINEGAR.

*Report.*—Commended for the exhibition of light white wine vinegar of excellent aromatic taste.**678. José Montaner & Rincon, Reus, Tarragona, Spain.**

VINEGAR.

*Report.*—Commended for the very excellent quality of white wine vinegar exhibited, of fine, high, delicate flavor.**679. Xavier Romero, Orense, Spain.**

VINEGAR.

*Report.*—Commended as an exhibition of white wine vinegar of fine flavor and strength.**680. José Ferrandis & Soler, Onteniente, Valencia, Spain.**

VINEGAR.

*Report.*—Commended for the excellent flavor of white wine vinegar of medium strength.**681. Basilio Torisces, Moguer, Huelva, Spain.**

VINEGAR.

*Report.*—Commended for the good quality of strong, dark-colored wine vinegar.**682. Jules Rojat, Nîmes, France.**

VINEGAR.

*Report.*—Commended for the white wine vinegar, vinegar from distilled spirit, and vinegar from a mixture of both materials, each of various degrees of strength, and all excellent; the first named especially so, with a most agreeable wine flavor. All are bright, clear, and in good condition.**683. Bornia Brothers, Treviso, Italy.**

VINEGAR.

*Report.*—Commended for fair quality and great cheapness of vinegar made from low-priced wines, of light and dark colors.



**684. Cav. Francesco Braggio, Strevi, Alessandria, Italy.****VINEGAR.**

*Report.*—Commended for the excellent quality of white wine vinegar (from Muscat wine), clear and of delicate flavor.

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**685. Pasquale Scala, Naples, Italy.****VINEGAR.**

*Report.*—Commended for the good quality of white wine vinegar exhibited.

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**686. Emanuel Neumann & Sons, Waitzen, Austria.****VINEGAR.**

*Report.*—Commended for the excellent quality of "vinegar spirit" (highly concentrated vinegar) exhibited.

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**687. Novelty Gas Machine Co., Baltimore, Md., U. S.****CARBURETTING GAS MACHINE.**

*Report.*—Commended for a special attachment for heating, cooking, and particularly for heating soldering irons for tinner's use.

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**688. Improved Steiner Gas Machine Co., Philadelphia, Pa., U. S.****PORTABLE GAS MACHINES.**

*Report.*—Commended for compactness, simplicity, and certainty of action.

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**689. Edward Coe, New Haven, Conn., U. S.****ELECTRO-AUTOMATIC GAS VALVE AND JET.**

*Report.*—Commended for the ingenuity, simplicity, and certainty of the mechanism.

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**690. Thos. F. Rowland, Brooklyn, N. Y., U. S.****STEAM STOKER; APPARATUS FOR DRAWING COKE AND CHARGING GAS RETORTS.**

*Report.*—Commended for perfection of coal transportation; accuracy of measurement of coal to the retorts; novel and effective method of drawing the retorts and recharging them by machinery driven by steam power.

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**691. Excelsior Gas Machine Co., South Norwalk, Conn., U. S.****GAS MACHINES.**

*Report.*—First, a "retort" gas machine of great capacity, excellent construction, and special adaptability to the lighting of towns. Second, a "maxim" gas machine of excellence of design and superiority of manufacture.

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**692. L. D. Towsley, Cincinnati, Ohio, U. S.****GAS MACHINE.**

*Report.*—Commended for compactness, durability, safety, and ease of management

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**693. Gilbert & Barker Manufacturing Co., Springfield, Mass., U. S.****"THE SPRINGFIELD GAS MACHINE."**

*Report.*—Commended for simplicity, safety, durability, and superior adaptation to the lighting of dwellings and moderate-sized buildings.

## 694. A. W. Rand, Philadelphia, Pa., U. S.

## "THE VICTOR GAS MACHINE."

*Report.*—Commended for excellence and simplicity of design, and superiority of workmanship.

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## 695. Morris, Tasker, &amp; Co., Philadelphia, Pa., U. S.

## GAS WORKS MACHINERY.

*Report.*—It exhibits the newest and best forms of gas machinery, constructed on novel plans, with the best workmanship.

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## 696. Phoenix Match Manufacturing Co., Malmö, Sweden.

## MATCHES.

*Report.*—Commended for the good quality of the matches with sulphur and those with phosphorus.

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## 697. Jönköping Match Manufacturing Co., Jönköping, Sweden.

## MATCHES.

*Report.*—Commended for the excellent quality of the matches with red phosphorus.

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## 698. Ferdinand Körner &amp; Co., Ellbo-Göteborg, Sweden.

## MATCHES.

*Report.*—Commended for the excellent manufacture of matches with red phosphorus.

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## 699. Heinrich Hochstätter, Langen, Germany.

## MATCHES.

*Report.*—Commended for odorless matches free from poison.

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## 700. Gadamer &amp; Jäger, Waldenburg, Germany.

## MATCHES.

*Report.*—Commended for matches remarkable for the excellence of the igniting mass.

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## 701. Ambrogio Dellacha, Moncalieri, Italy.

## MATCHES.

*Report.*—Commended for the perfect quality of the wax matches, and of those of wood without sulphur.

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## 702. Francesco Lavaggi, Trofarello, Turin, Italy.

## MATCHES.

*Report.*—Commended for the abundant and excellent manufacture of wax matches.

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## 703. R. H. Zennig &amp; Co., New York, N. Y., U. S.

## WAX MATCHES.

*Report.*—Commended for the excellent quality of the wax matches exhibited.

**704. Henrick Dons, Christiania, Norway.****MATCHES.**

*Report.*—Commended for good quality.

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**705. Bryant & May, London, England.****MATCHES.**

*Report.*—Commended for excellence of safety and wax matches and fusees. The character of the wax matches is particularly commendable.

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**706. Barber Match Co., Akron, Ohio, U. S.****DRAWING-ROOM MATCHES AND SULPHUR MATCHES.**

*Report.*—Commended for material improvement in the form of the stick and the mechanical arrangement for manufacturing the matches.

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**707. American Fusee Co. (Limited), Erie, Pa., U. S.****SAFETY MATCHES AND FUSEES.**

*Report.*—Commended as the only true safety match in the Exhibition. Its composition differs from that of most other safety matches in not containing a combination which would ignite on friction. The prepared surface on which it is ignited is free from amorphous phosphorus. It is water-proof and can be exposed to a high temperature without ignition. The safety fusee for out-door use will burn in wind and rain. The preparations are free from poisonous substances.

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**708. Wisby Match Manufacturing Co., Wisby, Sweden.****MATCHES.**

*Report.*—Commended for the good quality of the matches with red phosphorus.

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**709. Westervik Match Manufactory, Westervik, Sweden.****MATCHES.**

*Report.*—Commended for the good quality of the matches.

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**710. H. Jölsen's Match Factory, Christiania, Norway.****MATCHES.**

*Report.*—Commended for good quality.

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**711. Nitedals Match Manufactory, Christiania, Norway.****MATCHES.**

*Report.*—Commended for good quality.

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**712. J. B. Wünsch, Nuremberg, Germany.****GOLD AND SILVER GALLOONS, SPANGLES, LACES, AND EMBROIDERIES.**

*Report.*—Commended for very important manufacture of cemented copper wires gilded and silvered by electricity, so-called Leonie wires, and the working them up in the form of brocades and laces by machine and hand work; great variety of products exhibited.

## 713. Thomas Bennett &amp; Son, London, England.

GOLD-BEATERS' SKINS.

*Report.*—Commended for the good quality of the skins exhibited.

## 714. Trapp &amp; Münch, Friedberg, near Frankfort, Germany.

ALBUMINIZED PAPER.

*Report.*—Commended for its excellent quality.

## 715. John R. Clemens, Philadelphia, Pa., U. S.

ALBUMENIZED PAPER.

*Report.*—Commended for the very fine plain surface of paper as evidenced by some of the largest photographs now on exhibition.

## 716. Johann Zacherl, Vienna, Austria.

INSECT POWDER.

*Report.*—Commended for superior quality of insect powder.

## 717. M. H. Lummerzheim &amp; Co., Wondelghem, near Ghent, Belgium.

BITUMINOUS AND ASPHALTIC PAPER FOR ROOFING AND FOR THE NAVY.

*Report.*—Commended for the good quality and extreme cheapness of his bituminous and asphaltic paper.

## 718. Commandeur Julião Ribeiro de Castro, Campos, Rio de Janeiro, Brazil.

SUGAR.

*Report.*—Commended for the good quality of staple, light-yellow, soft sugar for export, made by common open-pan process.

## 719. John Green, London, England.

ORNAMENTAL SHEETS OF THIN GELATINE.

*Report.*—Commended for good quality of colored and printed gelatine in thin sheets for various ornamental purposes.

## 720. Fischer &amp; Schmitt, Höchst, Germany.

GELATINE.

*Report.*—Commended for the very superior quality of red and white gelatine.

## 721. C. J. Fell &amp; Brother (Agents for Geo. Nelson, London), Philadelphia, Pa., U. S.

GELATINE.

*Report.*—Commended for the excellent quality of gelatine preparations for various purposes.

## 722. Otto Lindembauer, Hanau, Germany.

GELATINE.

*Report.*—Commended for the very superior quality and great variety of gelatine, especially red and white.

**723. Jacquand Father & Son, Lyons, France.**

## GELATINES.

*Report.*—Commended for the extensive and careful manufacture of gelatines of different degrees of purity.

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**724. Tancrede Brothers, Paris, France.**

## GELATINES.

*Report.*—Commended for careful preparation in connection with the carbonization of bones for sugar making.

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**725. Coignet Father & Son, & Co., Paris, France.**

## GELATINES.

*Report.*—Commended for the very extensive preparation of ordinary and extra gelatines; perfect quality of the products shown; different manures prepared with the residues from the carbonization of bones, and with animal matters.

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**726. James Chalmers & Sons, Williamsville, N. Y., U. S.**

## GELATINE.

*Report.*—Commended for very good quality of gelatine for jellies and blanc-mange.

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**727. Public Slaughter-House, Florence, Italy.**

## ALBUMEN.

*Report.*—Commended for very fine samples of albumen from blood, and for the preservation of the yolks of eggs.

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**728. Sigmund Berg, Krakau, Austria.**

## ALBUMEN OF EGGS AND BLOOD.

*Report.*—Commended for the manufacture, on a large scale, of albumen from eggs, and of fluid preserved yolk of eggs, for the use of manufacturers of glove and calf-skin leather. The egg preparation for domestic use, carried on at the same time, is remarkable for excellent quality and cheapness.

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**729. Stein, Hirsch, & Co., Chicago, Ill., U. S.**

## EGG AND BLOOD ALBUMEN.

*Report.*—Commended for very good quality of blood and egg albumen and caseine for calico printers; dried blood for sugar refiners.

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**730. Fino, Luigi, & Co., Turin, Italy.**

## ALBUMEN.

*Report.*—Commended for albumen of good quality manufactured for printing stuffs.

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**731. Frederick Puckridge & Nephew, London, England.**

## GOLD-BEATERS' SKINS.

*Report.*—Commended for the fine quality of the skins, and the extensive scale on which they are made.

## 732. Phillips &amp; Jacobs, Philadelphia, Pa., U. S.

RECOVERY OF SILVER AND GOLD FROM WASTE PRODUCTS CONTAINING THE SAME.

*Report.*—Commended for recovery of pure silver and gold from refuse of photographers, electrotypists, and jewelers, and for illustration of the series of processes employed.

## 733. Stoeber &amp; Segitz, Fürth, Germany.

LEAF METAL AND WASTE.

*Report.*—Commended for a large and well-selected assortment; very large form; extensive production.

## 734. E. Kuhn's Wire Works, Nuremberg, Germany.

GOLD AND SILVER WIRES, SPANGLES, AND BULLION.

*Report.*—Commended for excellence of the products.

## 735. G. E. Schaetzler, Nuremberg, Germany.

LEAF GOLD AND PARTING-GOLD FOR DENTISTS.

*Report.*—Commended for excellent quality and great variety of the colors; excellently arranged method of manufacture.

## 736. Ludwig Spiegelberger, Fürth, Germany.

SILVER LEAF AND GOLD LEAF.

*Report.*—Distinguished for large size of the form produced.

## 737. Georg A. Beckh, Nuremberg, Germany.

GILT AND SILVERED WIRES, SPANGLES, AND BULLION.

*Report.*—The parti-colored plates are worthy of remark.

## 738. Janecke Brothers &amp; Fr. Schneemann, Hanover, Germany.

GROUND COLORS FOR PRINTERS' AND OTHER USES.

*Report.*—The colors are fine and varied, soft and opaque, and of most excellent quality.

## 739. Pacific Guano Co., Boston, Mass., U. S.

ARTIFICIAL FERTILIZERS AND RAW MATERIAL USED IN THEIR MANUFACTURE.

*Report.*—Commended for the excellence of the raw material used in the manufacture of chemical fertilizers, such as bone-meal, South Carolina fossil bone phosphatic nodules, nitrate of soda, sulphate of ammonia, dried and powdered fish, pork refuse dried; for the considerable importance given their manufacture.

## OLIVE OILS.

## 740. Vinnoco Tellini, Pisa, Italy.

OLIVE OIL.

*Report.*—Commended for the good quality of the oil.

## 741. Francesco Talamo, Messina, Italy.

OLIVE OIL.

*Report.*—Commended for the good quality of the oil.

## 742. Vincenzo Mingori, Lucca, Italy.

OLIVE OIL.

*Report.*—Commended for the good quality of the oil.

## 743. Count A. Agostini Della Seta, Pisa, Italy.

OLIVE OIL.

*Report.*—Commended for the good quality of the oil.

## 744. Dandicolle, Son, &amp; Gaudin Sr., Bordeaux, France.

OLIVE OIL.

*Report.*—Commended for the exhibition of a good olive oil, with a distinct taste of fruit, placed upon the market at a very moderate price.

## 745. James Plagniol, Marseilles, France.

OLIVE OIL.

*Report.*—This exhibitor displays a fine collection of oils of different grades, clear and in good condition, quite bland, and with scarcely a trace of taste of the fruit.

## 746. F. Mottet &amp; Co., Marseilles, France.

OLIVE OIL.

*Report.*—The oil shown is of the highest grade, fine, clear, and bland.

## 747. Mestrezat &amp; Co., Bordeaux, France.

OLIVE OIL.

*Report.*—Commended for the good quality of olive oil exhibited, bland and without taste of fruit.

## 748. José Cantuel &amp; Lopez, Cordova, Spain.

OLIVE OIL.

*Report.*—Limpid, very good taste.

## 749. The Widow Duchess of Medinaceli, Espejo, Cordova, Spain.

OLIVE OIL.

*Report.*—Limpid; good taste.

## 750. Pedro Contreras Moreno, Almeria, Spain

OLIVE OIL.

*Report.*—Colorless; delicate taste.

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751. Francisco Gil, Reus, Tarragona, Spain.

OLIVE OIL.

*Report.*—Of good quality; limpid, and fruity of flavor.

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## 752. Pedro Sirvent &amp; Oliver, Reus, Tarragona, Spain.

OLIVE OIL.

*Report.*—Very limpid, and of very good fruity flavor and taste.

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## 753. Oscar Lafitte, Cherchel, Algeria.

OLIVE OIL.

*Report.*—Commended for the good quality of Algerian olive oil shown, clear, bright, and free from rancidity, with distinct taste of the fruit.

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## 754. Government of Salonica, Turkey.

OLIVE OIL.

*Report.*—Olive oil with a very agreeable and peculiar fruity taste.

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## 755. Theophani Nikiforaki, Crete, Turkey.

OLIVE OIL.

*Report.*—Limpid, very good fruity taste.

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## 756. Samuel Davenport, Adelaide, South Australia, Australia.

OLIVE OIL.

*Report.*—The olive oil exhibited is of excellent quality, bland and free from any disagreeable taste or smell, manufactured partly from the fruit of imported French olives, partly from seedlings. This appears to represent the commencement, upon a moderate scale, of an important colonial industry promising excellent results.

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## 757. Francisco Sanz &amp; Talva, Maspujols, Tarragona, Spain.

OLIVE OIL.

*Report.*—Olive oil very limpid, and very good fruity taste.

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## 758. Agustin Peira &amp; Mach, Scalla Dei, Spain.

OLIVE OIL.

*Report.*—Of very delicate taste.

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## 759. Francisco Polop Diego, Jatira, Valencia, Spain.

OLIVE OIL.

*Report.*—Limpid; delicate taste.

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## 760. Vicente Oliag, Chiva, Valencia, Spain.

OLIVE OIL.

*Report.*—Very limpid; very delicate taste.

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761. Emilio Perez & Alegret, Ibi, Alicante, Spain.

OLIVE OIL.

*Report.*—Limpid; good fruity taste.

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## 762. Francisco Fuster, Palma de Mallorca, Balears, Spain.

OIL.

*Report.*—Oil from almonds: good quality and limpid.

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## 763. Bartolomé Calabuyg, Bocairente, Valencia, Spain.

OLIVE OIL.

*Report.*—Of good quality; fruity flavor.

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## 764. Blas Antonio Camanas, Valencia, Spain.

OLIVE OIL.

*Report.*—Very limpid; very delicate taste.

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## 765. J. M. Ibarra &amp; Sons, Seville, Spain.

OLIVE OIL.

*Report.*—Pale color; limpid; very delicate taste.

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## 766. Countess of Buréta, Alagon, Zaragoza, Spain.

OLIVE OIL.

*Report.*—Very limpid; very delicate taste.

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## 767. José Montagut Illa, Reus, Tarragona, Spain.

OLIVE OIL.

*Report.*—Very good fruity taste.

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## 768. Felipe Mendez, Mairena del Alcor, Seville, Spain.

OLIVE OIL.

*Report.*—A very nice fruity flavor.

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## 769. Francisco Collantes de Teran, Seville, Spain.

OLIVE OIL.

*Report.*—Limpid; fruity flavor.

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## 770. Manuel Alfonso Torres, Jimena, Jaen, Spain.

OLIVE OIL.

*Report.*—Limpid, and of good fruity flavor.

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## 771. Jose Rodriguez &amp; Rodriguez, Huelva, Spain.

OLIVE OIL.

*Report.*—Commended for very delicate flavor.

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## 772. Francisco Esteban Mendoza, Zaragoza, Spain.

OLIVE OIL.

*Report.*—Limpid; fruity taste.  

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## 773. José Angulo, Moron, Seville, Spain.

OLIVE OIL.

*Report.*—Limpid; good taste.  

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## 774. Miguel Salcedo &amp; Gomez, Jimena, Jaen, Spain.

OLIVE OIL.

*Report.*—Very good, fruity of taste and flavor.  

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## 775. Ciro Perez Payas, Monovar, Alicante, Spain.

OLIVE OIL.

*Report.*—Limpid; very good, fruity of flavor.  

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## 776. Manuel Porcar &amp; Uncle, Barcelona, Spain.

OLIVE OIL.

*Report.*—Olive oil of good quality and peculiar taste.  

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## 777. Cayetano Leygonier, St. Agustin, Seville, Spain.

OLIVE OIL.

*Report.*—Olive oil of nice golden color and delicate flavor.  

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## 778. Miguel Basseda &amp; Andreu, Reus, Tarragona, Spain.

OLIVE OIL.

*Report.*—Olive oil very limpid and very good fruity taste.  

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## 779. Juan Miret, Constanti, Tarragona, Spain.

OLIVE OIL.

*Report.*—Olive oil of very good fruity flavor.  

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## 780. Benedetto Tucci-Savo, Rome, Italy.

OLIVE OIL.

*Report.*—Commended for the good quality of the oil.  

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## 781. Marquis Pietro Marini, Rome, Italy.

OLIVE OIL.

*Report.*—Commended for the good quality of the oil.  

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## 782. Count Pietro Pompeo Masetti, Florence, Italy.

OLIVE OIL.

*Report.*—Commended for the good quality of the olive oil.

**783. Marquis Carlo Mortillaro de Villarena, Palermo, Italy.**

OLIVE OIL.

*Report.*—Commended for the good quality of the oil.

---

**784. Antonio Marfurt, Foligno, Italy.**

OLIVE OIL.

*Report.*—Commended for the good quality of the olive oil.

---

**785. Chamber of Commerce and Arts, Siena, Italy.**

OLIVE OIL.

*Report.*—Commended for the collections of oils from the provinces of Siena and Grosseto.

---

**786. Alessandro Botti, Chiavari, Italy.**

OLIVE OILS.

*Report.*—Commended for the excellent quality of the oils.

---

**787. Carlo Niemark, Leghorn, Italy.**

OLIVE OILS.

*Report.*—Commended for the excellent quality of the oils.

---

**788. Agrarian Committee, Florence, Italy.**

OLIVE OIL.

*Report.*—Commended for the beautiful collection of oils of excellent quality of the group of exhibitors represented by the Agrarian Commission of Florence.

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**789. Domenico Fazio, Palermo, Italy.**

OLIVE OIL.

*Report.*—Commended for the excellent quality of the olive oil.

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**790. Baron Bettino Ricasoli, Florence, Italy.**

OLIVE OIL.

*Report.*—Commended for the excellent quality of the oil.

---

**791. Calogero Russo, Termini, Palermo, Italy.**

OLIVE OIL.

*Report.*—Commended for the excellent quality of the oil.

---

**792. Pietro Isnard, Leghorn, Italy.**

OLIVE OIL.

*Report.*—Commended for the excellent quality of the olive oil.

---

**793. Pucci Sansedoni Alessandro, Siena, Italy.**

OLIVE OIL.

*Report.*—Commended for the excellent quality of the oil.

**794. Marchese Alli Maccarani Claudio, Florence, Italy.**

OLIVE OIL.

*Report.*—Commended for the good quality of the olive oil.**795. Barone Sciacca della Scala, Palermo, Italy.**

OLIVE OIL.

*Report.*—Commended for the good quality of the oil.**796. Conti Capponi Brothers, Florence, Italy.**

OIL.

*Report.*—Commended for the good quality of the oil.**797. Count Bartolomeo Cenami, Lucca, Italy.**

OLIVE OIL.

*Report.*—Commended for the good quality of the oil.**798. Dr. Felice Maltese, Vittoria, Italy.**

OLIVE OIL.

*Report.*—Commended for the good quality of the oil.**799. Francesconi Callisto, Lucca, Italy.**

OLIVE OIL.

*Report.*—Commended for the good quality of the oil.**800. Cesare Galli, Florence, Italy.**

OLIVE OIL.

*Report.*—Commended for the good quality of the oil.**801. Taruffi Luigi & Brothers, Leghorn, Italy.**

OLIVE OIL.

*Report.*—Commended for the excellent quality of the oil.**802. Solinas Arras Giuseppe, Sassari, Italy.**

OLIVE OIL.

*Report.*—Commended for the good quality of the oil.**803. Alessandro Saracini, Siena, Italy.**

OLIVE OIL.

*Report.*—Commended for the collection of good oils.**804. Eliseo Pacchiani, Passignano, Italy.**

OLIVE OIL.

*Report.*—Commended for the good quality of the oil.

**805. Jose Filippe de Sá, Santarem, Portugal.**

OLIVE OIL.

*Report.*—Very clear; nice golden color and fruity flavor and taste.

---

**806. Viscount of Abrançalha, Abrantes, Santarem, Portugal.**

OLIVE OIL.

*Report.*—Very limpid; a very delicate fruity flavor and taste.

---

**807. Antonio Garcia d'Andrade, Elvas, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Of a limpid, golden color, and fruity taste.

---

**808. Count of Atalaya, Quinta de Santa Martha, Santarem, Portugal.**

OLIVE OIL.

*Report.*—Very clear; nice golden color; a very delicate fruity taste.

---

**809. Count of Junqueira, Quinta da Lorna, Almeirim, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear; a very agreeable fruity flavor and taste: a very superior table olive oil.

---

**810. Jose Maria Corinho, Montargil, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Of a nice pale color and a delicate fruity taste.

---

**811. J. P. da Costa Pinto, Souzel, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Limpid and pure, and of a nice golden color; fruity flavor and taste.

---

**812. Joaquim Manoel Theotonio, Sr., Serpa, Beja, Portugal.**

OLIVE OIL.

*Report.*—Very clear; nice golden color; a very agreeable fruity taste.

---

**813. Jose Rodrigues da Costa, Pernamacor, Portugal.**

OLIVE OIL.

*Report.*—Of a very agreeable fruity taste.

---

**814. Francisco Rodrigues Abreu, Abrantes, Santarem, Portugal.**

OLIVE OIL.

*Report.*—Commended as very clear and limpid, nice golden color, and an excellent fruity flavor and taste.

---

**815. Carlos da Costa Pereira Mendes, Thomar, Santarem, Portugal.**

OLIVE OIL.

*Report.*—Very clear and limpid, and a fruity flavor and taste.

816. **Alexander Herculano de Carvalho, Valle de Lobos, Santarem, Portugal.**

OLIVE OIL.

*Report.*—Commended for perfectly clear and limpid, and a very nice and fruity taste; superior table olive oil.

---

817. **Jose de Saldanha Oliveira e Souza, Lisbon, Portugal.**

OLIVE OIL.

*Report.*—Commended for perfectly clear and very agreeable fruity flavor and taste.

---

818. **Jorge Abraham de Almeida Lima, Seixal, Lisbon, Portugal.**

OLIVE OIL.

*Report.*—Commended for nice pale color and a very delicate fruity taste.

---

819. **Ignacio C. de Benos Caldeira, Castello Branco, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Limpid, and of a very delicate flavor.

---

820. **Francisco de Paula Santa Clara, Elvas, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Limpid; nice pale color; fruity flavor and taste.

---

821. **Cazimiro Barreto Sachetti, Aveiro, Portugal.**

OLIVE OIL.

*Report.*—Very limpid, and of a very delicate fruity taste.

---

822. **Jose Maria Ramalho, Evora, Portugal.**

OLIVE OIL.

*Report.*—Very clear, and of a very delicate fruity taste.

---

823. **Antonio d'Araujo Zuarte de Campos, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear, and of a very agreeable fruity flavor and taste.

---

824. **Maria Jose Larcher, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Very clear, nice golden color, and of delicate fruity flavor and taste.

---

825. **Jose Rodrigues Tocha, Estremoz, Evora, Portugal.**

OLIVE OIL.

*Report.*—Commended for a very delicate fruity taste.

---

826. **Rebello Valente Allen, Campanha, Oporto, Portugal.**

OLIVE OIL.

*Report.*—Clear, and of a very delicate fruity taste and flavor.

**827. Lima Mayer & Sons, Lisbon, Portugal.**

OLIVE OIL.

*Report.*—Of great fluidity, and very convenient for machinery, for which purpose it has been exhibited.

---

**828. João Joaquim Bagulho, Villa Boim, Elvas, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear, of nice golden color, and a very delicate fruity flavor and taste.

---

**829. Abecassis Brothers, Lisbon, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear, and of a very delicate fruity flavor and taste.

---

**830. Almeida, Sa, & Co., Lisbon, Portugal.**

OLIVE OIL.

*Report.*—Of a nice fruity taste.

---

**831. Antonio Marcellino Carrilho Bello, Castello de Vide, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Very clear, and of a delicate fruity flavor and taste.

---

**832. B. Barros Gomes, Lisbon, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear golden color; very agreeable fruity flavor and taste; a very superior olive oil.

---

**833. Ladislau Xavier Bertão, Torrão, Beja, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear, and of a very agreeable fruity flavor and taste.

---

**834. Eduardo Aug. da Cruz Vaz, Castello Branco, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear, and of a very agreeable fruity flavor and taste.

---

**835. Countess of Anadia, Santa Clara, Coimbra, Portugal.**

OLIVE OIL.

*Report.*—Commended for perfectly clear, nice golden color, and a very agreeable fruity flavor and taste.

---

**836. Alexandre Thomas da Costa Pinto, Bibalonga, Bragança, Portugal.**

OLIVE OIL.

*Report.*—Commended for a very delicate fruity taste.

---

**837. Joaquim Rodrigues Couceiro, Elvas, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Commended for the limpid, fruity flavor and taste, and nice pale color.

**838. Egydio Jose Duarte, Castello de Vide, Portalegre, Portugal**

OLIVE OIL.

*Report.*—Commended for the perfectly clear, nice golden color, and a very agreeable fruity flavor and taste.

---

**839. Joaquim Fernandes, Mogao, Santarem, Portugal.**

OLIVE OIL.

*Report.*—Commended as very limpid and a very excellent fruity flavor and taste.

---

**840. Manoel Maria de Pina, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Commended for nice pale color and a very delicate fruity taste.

---

**841. Count of Gracioza Arcos, Aveiro, Portugal.**

OLIVE OIL.

*Report.*—Commended for very delicate fruity taste and flavor.

---

**842. Geraldês Vaz Preto, Souza, Castello Branco, Portugal.**

OLIVE OIL.

*Report.*—Commended for very good fruity taste, and superior table olive oil.

---

**843. Antonio da Costa, Elvas, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Limpid, and of fruity flavor.

---

**844. Martinho de França Azevedo Coutinho, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Very limpid; of delicate fruity flavor.

---

**845. João da Fonseca Coutinho, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Very limpid and clear, and of a very delicate fruity flavor and taste.

---

**846. Antonio Maria Chiccorro, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Very clear, nice color; a very delicate fruity taste.

---

**847. Luiz d'Oliveira Calheiros, Lisbon, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear; a very nice golden color, and excellent fruity taste; superior table olive oil.

---

**848. Antonio José de Carvalho, Elvas, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear; a very delicate fruity flavor and taste.



**849. Viscount of Castello de Borges, Lisbon, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear; a nice golden color; a good fruity flavor and taste.**850. Jose Maria Casqueiro, Crato, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—A very delicate fruity taste; a very nice golden color.**851. Antonio Mendo Caldeira Castel-Branco, Alter do Chão, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Perfectly limpid and clear; a very delicate fruity flavor and taste.**852. João da Silva Ferrão Castello Branco, Santa Iria, Villa Franca, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear and limpid; very nice and delicate fruity taste; very superior table olive oil, its quality illustrated by accompanying samples of sardines preserved therein.**853. Simão Pinto de Mesquita Carvalho, Santa Leocadia, Oporto, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear and limpid; delicate taste.**854. Pedro Manoel Durão, Castello de Vide, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Very clear, and of an agreeable fruity taste.**855. Joseph, Viscount of Esperance, Beja and Evora, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear; nice color; a very delicate fruity flavor and taste.**856. Joaquim da Motta Ferreira, Rio Maior, Santarem, Portugal.**

OLIVE OIL.

*Report.*—Of very good fruity flavor.**857. Joaquim Filippe Fernandes, Beja, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear; nice golden color; a very delicate fruity flavor and taste.**858. Eduardo Freixedas, Castello de Vide, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Very clear, and of a very delicate fruity flavor and taste.**859. Jose Nicolau Ferreira, Chamusca, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear; golden color; a very agreeable fruity flavor and taste; a superior table olive oil.

**860. Jose dos Santos Gouvea, Constança, Santarem, Portugal.**

OLIVE OIL.

*Report.*—A very nice golden color; delicate fruity taste.**861. Joaquim Jose da Guerra, Elvas, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear; nice golden color; a very agreeable fruity taste and flavor.**862. Widow Jorge & Fos, Parreiras, Santarem, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear; a very delicate fruity flavor and taste.**863. Joaquim Jose Ferreira, Elvas, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Limpid, and of fruity flavor and taste.**864. Guilherme Kempe, Lisbon, Portugal.**

OLIVE OIL.

*Report.*—Of great fluidity; very good for machinery, for which purpose it is exhibited.**865. João Jose Le Cocq, Castello de Vide, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear and limpid; a very nice golden color; an excellent fruity taste and flavor; a superior table olive oil.**866. Casimiro Esteves Mendes, Aviz, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Of a very agreeable, fruity taste.**867. Pedro Jose de Mesquita, Coimbra, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear, and of a very delicate taste.**868. Jose Paulo de Mira, Evora, Portugal.**

OLIVE OIL.

*Report.*—Clear and limpid; a delicate fruity taste; a very good table olive oil.**869. Maria Emilia d'Almeida Morão, Penamacor, Castello Branco, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear, and of delicate fruity taste.**870. Manoel Jeronymo Mocinha, Campo Maior, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear; nice golden color; excellent fruity flavor and taste.

**871. Joaquim Augusto de Macedo,\* Thomar, Santarem, Portugal.**

OLIVE OIL.

*Report.*—Perfectly limpid; very good fruity taste.**872. Pedro Xavier Machado, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Limpid, and of fruity flavor.**873. Manoel Antonio de Mattos, Campo Maior, Portugal.**

OLIVE OIL.

*Report.*—Very clear and limpid; a very delicate fruity flavor and taste.**874. Luiz Antonio de Magalhaes, Fundão, Castello Branco, Portugal.**

OLIVE OIL.

*Report.*—Nice color; a very agreeable fruity taste and flavor.**875. Joaquim Felizardo da Cunha Ozorio, Arronches, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Very limpid and clear; a very delicate fruity flavor and taste.**876. Antonio Possidonio, Montalvão, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Limpid; fruity taste.**877. Jose Nunes de Souza Peixoto, Penafiel, Oporto, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear; a very excellent fruity flavor and taste.**878. Manoel Peres Ramirez, Evora, Portugal.**

OLIVE OIL.

*Report.*—Perfectly limpid; nice golden color; a very delicate fruity flavor and taste.**879. Carlos Relvas, Gollega, Portugal.**

OLIVE OIL.

*Report.*—Extremely clear and limpid; delicate fruity taste.**880. Joaquim Antonio Rijo, Elvas, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear; a very delicate fruity flavor and taste.**881. João do Carmo Rapozo, Moura, Beja, Portugal.**

OLIVE OIL.

*Report.*—Very clear; a very agreeable fruity taste and flavor.

**882. P. J. Matheu Vieira da Rosa, Tatima, Santarem, Portugal.**

OLIVE OIL.

*Report.*—Very clear; a delicate fruity flavor and taste.**883. Luiz Xavier de Barros, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Very limpid and clear, golden color, and delicate taste.**884. Raymundo Jose Soares Mendes, Abrantes, Santarem, Portugal.**

OLIVE OIL.

*Report.*—Very clear; a very agreeable fruity flavor and taste.**885. Jose Themudo Soares, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Very limpid; good taste and flavor; nice golden color.**886. Joaquim Soares da Costa, Oporto, Portugal.**

OILS.

*Report.*—Ground-nut (*Arachys Hypogaea*) oil, almond oil, and castor (*Ricinus*) oil, perfectly limpid and in excellent condition.**887. Simeon Tierno, Elvas, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Very clear; light color; a very agreeable fruity flavor and taste.**888. Carlos Augusto Teixeira, Grandola, Lisbon, Portugal.**

OLIVE OIL.

*Report.*—Very clear and limpid; a delicate fruity flavor and taste.**889. Joaquim Guilherme da Vasconcellos, Elvas, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Perfectly clear; nice pale color; a very agreeable fruity taste.**890. Jose d'Oliveira Zugueite, Leiria, Portugal.**

OLIVE OIL.

*Report.*—Very limpid and clear; an agreeable fruity taste.**891. Maximo Falcão, Santarem, Portugal.**

OLIVE OIL FOR THE TABLE AND FOR MACHINERY.

*Report.*—That for the table is perfectly clear, of a very nice fruity flavor and taste; that for machinery has great fluidity, and is very good for the purpose for which it is exhibited.**892. Jose Nunes da Silva, Elvas, Portalegre, Portugal.**

OLIVE OIL.

*Report.*—Very limpid; a very agreeable fruity flavor and taste.

## 893. Jose Eduardo Levita, Portalegre, Portugal.

OLIVE OIL.

*Report.*—Very clear and limpid; nice golden color; a very delicate fruity flavor and taste.

## 894. Jose Candido de Sant' Anna, Elvas, Portalegre, Portugal.

OLIVE OIL.

*Report.*—Very clear and limpid; a delicate fruity taste.

## SIGNING JUDGES OF GROUP III.

The figures annexed to the names of the Judges indicate the reports written by them respectively.

F. A. GENTH, 1, 12, 13, 14, 15, 16, 67, 68, 71, 83, 91, 92, 93, 94, 95, 96, 104, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 127, 136, 156, 157, 168, 169, 171, 175, 190, 197, 198, 264, 266, 267, 268, 270, 271, 273, 274, 275, 276, 281, 282, 283, 285, 286, 287, 288, 296, 342, 344, 345, 347, 348, 350, 351, 358, 360, 361, 362, 364, 367, 368, 369, 371, 372, 374, 377, 419, 420, 423, 426, 431, 432, 437, 475, 476, 514, 552, 553, 554, 596, 707, 716, 720, 721, 722, 726, 729.

C. A. JOY, 2, 69, 138, 139, 218, 247, 248, 464, 606, 607, 608, 610, 612, 618, 619, 620, 621, 622, 623, 624, 627.

J. LAWRENCE SMITH, 3, 27, 173, 174, 178, 219, 265, 373, 382, 410, 414, 427, 440, 459, 460, 461, 462, 463, 481, 501, 509, 511, 512, 513, 706, 713, 714, 715, 731, 738.

WILLIAM ODLING, 4, 5, 6, 7, 8, 9, 10, 11, 17, 19, 20, 21, 22, 23, 24, 25, 26, 28, 63, 70, 134, 135, 137, 170, 172, 250, 272, 278, 279, 280, 289, 291, 292, 297, 298, 299, 300, 302, 303, 307, 346, 407, 408, 409, 424, 458, 473, 478, 645, 732.

J. W. MALLET, 18, 64, 72, 74, 75, 76, 85, 86, 87, 88, 89, 90, 97, 98, 99, 100, 101, 102, 105, 133, 142, 143, 147, 148, 149, 151, 152, 153, 154, 155, 158, 159, 161, 167, 176, 177, 179, 180, 216, 217, 220, 221, 222, 223, 224, 225, 226, 227, 228, 245, 246, 249, 251, 252, 263, 290, 294, 301, 304, 305, 306, 308, 311, 337, 338, 340, 349, 359, 363, 365, 366, 370, 375, 376, 390, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 425, 430, 433, 434, 438, 439, 441, 442, 443, 444, 445, 455, 456, 471, 472, 477, 479, 482, 483, 484, 510, 515, 516, 517, 518, 519, 520, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 597, 598, 599, 600, 601, 602, 603, 604, 605, 609, 611, 613, 614, 615, 616, 617, 625, 626, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 705, 718, 719, 744, 745, 746, 747, 753, 756.

J. F. KUHLMANN, 29, 30, 31, 32, 33, 34, 35, 37, 38, 40, 41, 42, 47, 48, 51, 54, 55, 56, 57, 58, 59, 66, 84, 129, 144, 260, 269, 277, 309, 310, 312, 313, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 328, 329, 330, 331, 332, 333, 334, 336, 379, 380, 384, 385, 386, 387, 389, 392, 393, 394, 395, 521, 723, 724, 725.

R. VON WAGNER, 39, 45, 46, 49, 50, 52, 53, 61, 62, 65, 73, 77, 78, 79, 80, 82, 103, 140, 145, 165, 166, 229, 230, 257, 262, 293, 314, 327, 378, 383, 411, 412, 413, 415, 416, 417, 418, 421, 422, 429, 435, 446, 465, 466, 467, 468, 474, 699, 700, 712, 728, 733, 734, 735, 736, 737.

E. PATERNO, 43, 44, 60, 162, 214, 215, 234, 235, 335, 352, 353, 354, 381, 388, 436, 448, 449, 450, 451, 453, 494, 498, 696, 697, 698, 701, 702, 703, 704, 708, 709, 710, 711, 727, 730, 740, 741, 742, 743, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804.

C. F. CHANDLER, 81, 131, 146, 181, 182, 183, 184, 185, 186, 187, 188, 189, 191, 192,

193, 194, 195, 196, 208, 259, 261, 339, 341, 356, 391, 687, 688, 689, 690, 691, 692, 693, 694, 695.

P. DE WILDE, 36, 123, 124, 125, 126, 128, 130, 132, 141, 160, 163, 164, 199, 200, 201, 202, 203, 204, 205, 206, 207, 209, 210, 211, 212, 213, 231, 232, 233, 236, 237, 238, 239, 240, 241, 242, 243, 244, 253, 254, 255, 256, 258, 284, 295, 343, 355, 357, 428, 447, 452, 454, 457, 469, 470, 480, 485, 486, 487, 488, 489, 490, 491, 492, 493, 495, 496, 497, 499, 500, 502, 503, 504, 505, 506, 507, 508, 717, 739.

J. BATALHA REIS, 150, 748, 749, 750, 751, 752, 754, 755, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894.

## SUPPLEMENT TO GROUP III.

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### REPORTS OF JUDGES ON APPEALS.

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#### JUDGES.

JOHN FRITZ, Bethlehem, Pa.  
EDWARD CONLEY, Cincinnati, Ohio.  
CHARLES STAPLES, JR., Portland, Me.  
BENJ. F. BRITTON, New York City.  
H. H. SMITH, Philadelphia, Pa.

COLEMAN SELLERS, Philadelphia, Pa.  
JAMES L. CLAGHORN, Philadelphia, Pa.  
HENRY K. OLIVER, Salem, Mass.  
M. WILKINS, Harrisburg, Oregon.  
S. F. BAIRD, Washington, D. C.

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#### 1. Jno. Ching, Queensland, Australia.

##### DUGONG OILS.

*Report.*—The oil from the dugong of fine quality, being free from smell or taste after the heat of summer, and well adapted to the same purposes as cod-liver oil, and less nauseous.

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#### 2. Bullock & Crenshaw, Philadelphia, Pa., U. S.

##### SUGAR-COATED PILLS.

*Report.*—Commended for superior workmanship, quality, and fitness for the purpose intended.

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#### 3. Hance Brothers & White, Philadelphia, Pa., U. S.

##### FLUID AND SOLID EXTRACTS, ELIXIRS, AND RESINOIDS.

*Report.*—Commended for superior quality, skill in preparation, and adaptation to purpose.

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#### 4. I. Newton Peirce, Philadelphia, Pa., U. S.

##### STONE SURFACE ENAMEL.

*Report.*—Commended for excellent quality and adaptation to purpose intended.



**5. Harrison Brothers & Co., Philadelphia, Pa., U. S.**

WHITE LEAD, SYLVAN GREEN, AND MIXED PAINTS.

*Report.*—Commended for white lead of perfect whiteness, purity, density of body, and firmness of preparation, and sylvan green and ready mixed paints of chemical purity and adaptation to purpose intended.

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**6. Pioneer Oil Co., Salem, Oregon, U. S.**

LINSEED OIL.

*Report.*—Commended for superior quality, fine color, being clear, pure, and free from sediment; of excellent body and high merit.

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**7. Heide & Wirtz, New York, N. Y., U. S.**

ALMOND PASTE FOR CONFECTIONERY.

*Report.*—Commended for quality, purity, and adaptation to purpose intended.

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**8. Brunner, Mond, & Co., Northwich, Cheshire, England.**

CHEMICALS.

*Report.*—Commended for excellent quality and adaptation to purpose intended.

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**9. Allen & Hanburys, London, England.**

COD-LIVER OIL.

*Report.*—Cod-liver oil made in Norway, of excellent quality and purity.

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**10. Oreste Mottura, Modena, Italy.**

COPYING INK.

*Report.*—Copying ink for a dark copy without previously wetting the paper.

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**11. Felice Genevois & Sons, Naples, Italy.**

SHAVING SOAP.

*Report.*—Commended for fine quality and utility.

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**12. Cosentini & Caruso Ditta, San Mauro Marchesato, Cotrone, Calabria, Italy.**

LICORICE.

*Report.*—Commended for good quality and purity.

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**13. Candiani & Biffi, Milan, Italy.**

CHEMICAL PRODUCTS, AS SULPHURIC ACID.

*Report.*—Commended for quality and adaptation to public wants.

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**14. Doña Natividad Yznaga, Cuba.**

SUGAR.

*Report.*—Commended for good quality of samples exhibited.

## 15. Norrköping Match Manufacturing Co., Norrköping, Sweden.

## IMPREGNATED SAFETY MATCHES.

*Report.*—Commended for good quality and utility.

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## 16. Pellier Co., Caracas, Venezuela.

## STEARINE CANDLES.

*Report.*—Commended for quality and fitness for the purpose intended, having stood the heat of summer.

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## 17. G. Fisher, Caracas, Venezuela.

## VINEGAR.

*Report.*—Commended for good quality and purity.

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## 18. Andrés Estruch &amp; Co., Barcelona, Spain.

## MANURES.

*Report.*—Commended for quality and utility in vineyards, trees, grains, and vegetables.

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## 19. I. W. Cramer, Fürth, Germany.

## SILVER AND ALUMINIUM FOILS AND GOLD FOILS FOR GILDING.

*Report.*—Commended for a good exhibit of articles well made and adapted to purpose intended.

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## 20. Angus Mackay, Queensland, Australia.

## EUCALYPTUS GUMS.

*Report.*—Commended for a rare and valuable exhibit of medicinal gums.

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## 21. G. Stürop &amp; Co., Caracas, Venezuela.

## ESSENCE OF SARSAPARILLA.

*Report.*—Commended for good quality.

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## 22. H. Ujhely &amp; Co., Stockerau, Austria.

## WAX CANDLES AND TAPERS OF CERESINE.

*Report.*—Commended for quality and adaptation to general use.

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## 23. Austrian Ceresine Manufactory, Stockerau, near Vienna, Austria.

## CERESINE AS CANDLES AND TAPERS.

*Report.*—Commended for superior quality and utility.

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## 24. Juan Gibert &amp; Soler, Tarragona, Spain.

## ESSENTIAL OILS OF LEMON.

*Report.*—Commended for good quality.

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## 25. Alejandro Planella &amp; Roure, Barcelona, Spain.

## VARNISHES AND COLORS.

*Report.*—Commended for good display of artists' colors and varnishes for artists' use.

## 26. John Clever, Werden, Germany.

CHEMICALS, TRIPOLI.

*Report.*—Commended for excellent quality and utility.

## 27. Chamber of Commerce, Sienna, Italy.

SIENNA EARTH—CRUDE AND BURNED.

*Report.*—Commended for good quality and adaptation to purpose intended.

## 28. Poschini Conte Gandenzio, Sienna, Italy.

OLIVE OIL.

*Report.*—Commended for quality and purity.

## 29. Collacchioni Senatore, Sienna, Italy.

OLIVE OIL.

*Report.*—Commended for purity and quality.

## 30. Contucci Eustachio, Montepulciano, Italy.

OLIVE OIL.

*Report.*—Commended for purity and good quality.

## 31. Ferri Vincenzo, Sienna, Italy.

OLIVE OIL.

*Report.*—Commended for quality and purity.

## 32. Ferri Brothers, Sienna, Italy.

OLIVE OIL.

*Report.*—Commended for good quality and purity.

## 33. Albergotti Mantejo, Italy.

OLIVE OIL.

*Report.*—Commended for quality and purity.

## 34. Casso Chini, Italy.

OLIVE OIL.

*Report.*—Commended for good quality.

## 35. Frederic Michaelis, Grand Duchy of Luxemburg.

CONCENTRATED VINEGAR.

*Report.*—Commended for good quality of concentrated vinegar.

## 36. Angus Mackay, Queensland Commission.

TANNING BARKS.

*Report.*—Commended for bark possessing a large amount of tannin.

37. **W. H. Brown, Peabody, Mass., U. S.**

GLUE AND SIZE.

*Report.*—Commended for variety and general excellence.38. **Wahl Brothers, Chicago, Ill., U. S.**

GLUE AND NEAT'S FOOT OIL.

*Report.*—Commended for general excellence of preparation, and variety of products.39. **Harrison Brothers & Co., Philadelphia, Pa., U. S.**

LITHARGE.

*Report.*—Litharge of perfect oxidation, purity, and fineness of texture, well adapted to potters' and glass and rubber makers' use.40. **Harrison Brothers & Co., Philadelphia, Pa., U. S.**

ACIDS.

*Report.*—Sulphuric, muriatic, nitric, and acetic acids, the sulphuric, muriatic, and nitric acids being of heavy gravity and purity, and the acetic acid of commercial quality and free from empyreuma and metallic acids.41. **The Adams White Lead Co., Baltimore, Md., U. S.**

WHITE LEAD.

*Report.*—Commended for the amorphous carbonate of lead, prepared by the ingenious and rapid new process patented by D. K. Tuttle and James A. McCreary, and in its properties not differing from the high grades of white lead made by the old method. Both the product and the process are meritorious.

## SIGNING JUDGES OF SUPPLEMENT TO GROUP III.

The figures annexed to the names of the Judges indicate the reports written by them respectively.

HENRY H. SMITH, 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 39, 40.

M. WILKINS, 6.

COLEMAN SELLERS, 14, 24, 25, 35.

SPENCER F. BAIRD, 37, 38.

F. A. GENTH, 41.



## GROUP IV.

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ANIMAL AND VEGETABLE PRODUCTS, AND THE  
MACHINERY FOR THEIR PREPARATION.

## GROUP IV.

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### JUDGES.

#### AMERICAN.

W. C. KERR, Raleigh, N. C.  
L. B. ARNOLD, Rochester, N. Y.  
JOSEPH F. TOBIAS, Philadelphia, Pa.  
JOHN BRADFORD, Tallahassee, Florida.  
GUIDO MARX, Toledo, Ohio.  
RYLAND T. BROWN, Indianapolis, Ind.  
WALTER S. GREENE, Milford, Wis.

#### FOREIGN.

JULIUS WEGELER, Germany.  
EDWARD MARTELL, France.  
EDWARD LORING, Spain.  
NICOLAU J. MOREIRA, Brazil.  
JAYME BATALHA REIS, Portugal.  
EKEDA KENZO, Japan.  
E. OLDENDORFF, Argentine Republic.  
E. H. VON BAUMHAUER, Netherlands.  
H. G. JOLY, Canada.  
G. F. SECCHI DE CASALI, Italy.  
THOMAS RÜSE SEGELCKE, Denmark.  
RUSTEM EFFENDI, Turkey.  
JUAN MORPHY, Spain.

JOHN D. IMBODEN was temporarily assigned from Group XV to assist in the examinations of tobacco.

### JUDGES OF BUTTER AND CHEESE.

F. W. FAIRMAN.

| GEORGE ADDY.

## GROUP IV.

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### ANIMAL AND VEGETABLE PRODUCTS, AND THE MACHINERY FOR THEIR PREPARATION.

CLASS 650.—Sponges, sea-weed, and other growths used for food or in the arts.

CLASS 651.—The dairy,—milk, cream, butter, cheese.

CLASS 652.—Tallow, oil, and lard; ivory, bone, horn, glue.

CLASS 653.—Eggs, feathers, down.

CLASS 654.—Honey and wax.

CLASS 655.—Animal perfumes,—as musk, civet, ambergris, etc.

CLASS 656.—Preserved meats, vegetables, and fruits; dried, or in cans or jars. Meat and vegetable extracts.

CLASS 657.—Flour; crushed and ground cereals; decorticated grains.

CLASS 658.—Starch and similar products.

(For sugar, syrups, etc., see Group III.)

CLASS 660.—Wines, alcohol, and malt liquors.

CLASS 661.—Bread, biscuits, crackers, and cakes

(For vegetable and other oils, see Group III.)

Yeast preparations, yeast powders, baking powders, etc.

CLASS 584.—Tobacco manufacturing machinery.

CLASS 585.—Mills for spices, coffee, etc.

CLASS 620.—Cereals.

CLASS 623.—Tobacco, hops, tea, coffee, and spices.

CLASS 580.—Flour mills.





# GENERAL REPORT

OF THE

## JUDGES OF GROUP IV.

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INTERNATIONAL EXHIBITION,  
Philadelphia, 1876.

PROF. FRANCIS A. WALKER, *Chief of the Bureau of Awards:*

SIR,—I have the honor to report a general view of the condition of the field of observation committed to Group IV. of the Board of Judges of the International Exhibition of 1876.

RYLAND T. BROWN,  
*President Group IV.*

## GROUP IV.

### ANIMAL AND VEGETABLE PRODUCTS, AND THE MACHINERY FOR THEIR PREPARATION.

BY RYLAND T. BROWN.

This group originally embraced only "animal and vegetable substances used for food;" but alcoholic compounds of every description, and tobacco in all the forms of its manufacture, were subsequently referred to it, as well as all the machinery concerned in their production, except that employed in the manufacture of flour. A glance at the field assigned to Group IV. will satisfy any one that the position of a Judge here involved much labor and responsibility.

Nominally the group consisted of eighteen Judges, but at no time were more than sixteen actually engaged in work. On the organization of the group, the first matter of business was to ascertain the specialty of each member, and assign him work in that line. A glance at the imperfect catalogues furnished us made it apparent that the heavy work of the group lay in Class 660, embracing vinous, malt, and distilled liquors; but, fortunately, our group contained a number of experts who were celebrated for their skill in this difficult task. Eight Judges were originally assigned to this section, and subsequently several others were temporarily detailed for special work with them. So heavy did this work prove that, when all the other sections had completed their task and the time allowed us by the Bureau had expired, there remained several exhibits of foreign liquors to be examined, and by courtesy of the proper authorities a portion of the Judges had leave to remain and complete the work. Hon. Guido Marx, of Toledo, Ohio, who, after the retirement of Mr. Wegeler, of Germany, had charge of the work of this section, has furnished a detailed statement of their labors, and a general view of the several qualities of liquors exhibited, which statement is herewith submitted.

DEAR SIR,—I have the pleasure to forward to you, herewith, a condensed report of that part of the work of the Judges of Group IV.

which was performed by me, or in which I took an active part, viz., wines, alcohol, and malt liquors,—especially the products of the Western Hemisphere,—besides parts of Class 656, embracing preserved fruits, meat, and vegetable extracts.

The examinations of wines and liquors exhibited by Germany, France, Italy, Spain, and Portugal were conducted chiefly by the Judges selected and sent from these respective countries, but I took, in most, especially those from Spain and Portugal, such an active part as to be enabled to include here a cursory glance at their general results at least.

In order to gain a proper classification of the vast material submitted to us, other than according to geographical lines, it will be best to follow the distinctions made in the commercial world, and to begin with the liquors of the least alcoholic strength, ascending through those of higher grades. The first part of my report will, consequently, comprise beer, ale, and porter; the second, wines; and the third, distilled liquors, with an addition for the parts of other classes examined.

## MALT LIQUORS.

Among the novelties in beer, and as the first to be mentioned because lowest in strength, is weiss-beer, the manufacture, or rather brewing, of which has but lately been introduced in the United States from Germany, where it has been quite a popular beverage for many years, principally in the vicinity of Berlin. It is, when well made, rich in carbonic acid gas and light in color, wherefrom its name,—weiss- or white-beer. Two breweries from the city of New York and one from Poughkeepsie had entered samples for examination, of which two were found worthy of being recommended for an award.

Another beer under this name, but of greater strength, was exhibited by Metzger Brothers, from Asti, Italy, and found most excellent; so was their beer from corn (maize), which may be mentioned here.

Among the beers usually classified as lager-beers, the first to be named is that of Norway, which properly belongs here, although called ale at home. Fourteen samples from nine different breweries in Christiania and Drammen were examined, and found of such good quality, generally light in body, fine in aroma, and agreeable in taste, as to merit very favorable mention, especially for their delicacy and keeping quality under transatlantic export.

Russia was represented on this field by four breweries, one each

from Warsaw, St. Petersburg, Drosdowo, and Charkov, all of which showed good brewings, two justifying awards.

Germany contributed, in more than twenty varieties, from sixteen of her most renowned breweries, including that from Schwechat, near Vienna, and Pilsen, in Austria, a good selection of the various styles of lager-beer indulged in, not only in its fatherland, but in many parts of the globe to which it is exported in bulk and in bottles. Although it would lead too far to mention in this report the names of all exhibitors, which the Catalogue will do more completely, I may state, as probably interesting to many, which of the German breweries maintained so well their old reputations at the Centennial Exhibition. They were the Tivoli, of Berlin; the Baron von Thüngen, in Weissenbach; Overbeck, in Dortmund; Sick, in Speyer; Boettinger, in Würzburg; Gaisel, in Neustadt-an-der-Hardt; Pschorr, in Munich; Freiherr von Pulleville, in Moehring; Wells, in Speyer; Dichmann and Sauerländer, in Aix-la-Chapelle (Aachen); Hildebrand, in Pfungstadt; Bayerische Actien Brewery, in Aschaffenburg; Dreher, in Schwechat, near Vienna; Beemen, Beck, & Co., Kaiser Brewery, in Bremen; H. Herminger & Sons, in Frankfort; and the first Pilsener Actien Brewery, Pilsen, Bohemia; besides that of the brewery in Berlin, which was "hors concours," the proprietor of it, Dr. Goldsmith, being one of the experts.

The activity and energy with which the brewing interests of the United States have developed their branch of industry into one of the leading ones of the country, uniting with steady progress in the adaptation of new mechanical appliances all the resources offered by the latest scientific investigations in matters connected with their business, was evidenced not alone in their fine and interesting display in Brewers' Hall, but even more in that furnished from the annexed ice-house, which presented to our examination, from the casks, samples of lager-beer from forty-eight different breweries. It was quite a task to justly discriminate between so many deserving exhibitors, and it took the closest scrutiny of each sample in the various requirements of a superior lager-beer to be able to designate those which merited special awards. By adopting an exact system of ratings, and with the assistance of experienced experts, I succeeded in selecting, according to a method which has given general satisfaction to all concerned, the names which have been presented to the Commission.

To bottle lager-beer to good advantage has also become quite an industry, and the fourteen exhibits from eight breweries making this a specialty proved how successful they had been in it.

## ALE.

The same good business qualities which characterize, in general, the brewers of lager-beer in the United States are also perceptible in the efforts put forth by their fellow-brewers in ale. Although not so numerous, they are certainly not surpassed in the quality of their products by their younger compeers. Thirteen breweries furnished samples of present-use ale, drawn from casks on the spot, and six presented ten different brewings bottled for domestic use and exportation, most of which satisfied all requirements as to a careful selection of material, and a fair proportion as to the best skill in using it.

The testing of stock ale having been postponed to a later date, and having been confided to other Judges, I am not able to include here an abstract of its results. Ale being an institution of considerable consequence with all English-speaking people, we found our Canadian neighbors well represented by five breweries, claiming on nine brands of ale—partly on draught, partly from bottles—the distinction due to careful and intelligent brewing.

Seven of the many well-known breweries of Great Britain were represented at the Exhibition by twelve different samples, mostly of bottled ale, a majority striving quite successfully for the recognition of the superiority of their stock and export ales.

One sample came from India, the Marree Brewery, in the Punjâb, which was quite noticeable for its quality, considering the place of manufacture. It is of the same as furnished to her Imperial Majesty's troops serving in the Punjâb.

Australia submitted ten samples of ale from seven breweries, six of which are situated in Kew, Melbourne, Carlton, Sandhurst, and Geelong, in Victoria, and one in Wellington, New Zealand.

Their exhibits prove that the art of brewing is not becoming lost in its march around the globe, but that Australia is even excelling some older communities in producing such ale as that brewed by P. J. Martin, in Melbourne, from Victoria malt and Tasmania hops.

Sweden made a very fair record for its ale by four samples from three breweries in Landskrono and Malmö.

The Netherlands were represented by only two samples of beer, both from Breda, from which no just conclusion could be drawn as to the condition of this branch of industry in Holland.

The same must be said of brewing in Portugal, for which Lisbon furnished from one brewery one sample each of beer, ale, and porter.

The two samples of ale and lager-beer presented by Plagemann &

Co., of Valparaiso, Chili, gave a very good opinion of the brewing of the west coast of South America; and the beer and porter from E. Bickert, in Buenos Ayres, as well as the strong-beer of Fernando Magdelin, in Santa Fé, gave equally good hopes for the development of this industry on the Atlantic coast in the Argentine Republic.

#### PORTER AND BROWN-STOUT.

These are so essentially Anglo-Saxon that we only find them in demand where this nationality predominates.

The United States presented samples of this dark commodity from two breweries in Philadelphia, Wm. Massey & Co.'s and Gardner & Sons', and one in Pottsville, Pennsylvania, D. G. Yuengling & Son's; the first of the three also presenting this article bottled as well as on draught.

Canada sent porter and stout from Montreal, Chatham, London, and Toronto, both in wood and glass; that from the last two cities giving the best satisfaction.

From Great Britain, only Glasgow and Maxton (near Dover) were represented for this examination, while Australia sent contributions from the cities of Kew, Carlton, and Geelong, in Victoria, and Wellington, in New Zealand. The fine condition in which their porter and stout arrived spoke well for its manufacturers.

#### WINE.

For a general classification we may divide the different kinds of wine known to commerce under eight principal headings. The first would comprise light white table-wines, of which Rhine wines or the so-called Hocks are the type. The second would include the so-called Clarets,—light red table-wines,—among which the French Bordeaux are the most known. The third I denote as the strong white wines, dry, for which the Sherries and Madeiras furnish the leading characteristics. The fourth is formed by the strong dry red wines, to which class some of the Burgundies of France and part of the so-called Port wines belong. The fifth would comprise the sweet white wines, of which the Muscatel is a fair representative; while the sixth would include the sweet red wines, of which Spain, Portugal, and the Cape of Good Hope furnish the leading kinds. The seventh might comprise the sparkling wines usually called Champagne, from the land of their largest production. And under the eighth I would unite wines from all other fruits and berries except grapes.

Thus the wines might be put in a tabular form, as follows:

White	{ light . . . .	Type: Rhine wine.
	{ strong, dry . . . .	" Sherry and Madeira.
	{ sweet . . . .	" Muscatel.
Red	{ light . . . .	" Claret.
	{ strong, dry . . . .	" Port and Burgundy.
	{ sweet . . . .	" Port and Cape of Good Hope.
Sparkling . . . .	"	Champagne.
Fruit wines . . . .	"	Cider, orange, and berry wines.

While most of the several wine-countries produce nearly all these kinds, the lighter wines are chiefly grown in the northern part of the grape-producing zone, while the stronger and sweeter wines are more favored by southern latitudes.

Having had a special assignment only to the wines of the Western Hemisphere, the details of the examinations of German, Austrian, Hungarian, French, and Crimean (Russian) wines were not in my hands, nor have I preserved any notes of those of Italy, at some of which I assisted.

The wines of Portugal and the Australian Colonies I shall undertake to classify, having been present at the examination of the largest part of their exhibits, and made notes concerning them. Having done the same with reference to the wines of Turkey, the Cape of Good Hope, and Spain, nearly all of which were examined while I was present, although the examination-in-chief devolved upon other hands, I feel competent to review the wines of the Old World in a comparison with those produced by the New.

In (Class 1) light white table-wines, Germany undoubtedly takes the lead, and preserves the position which, by general consent, has been conceded to it, although it must be admitted that some of the newer wine-raising countries begin to show very appreciable progress in supplying a demand which, so far, only the Rhine and its neighboring valleys have been able to meet. Some of the lighter white wines of France have frequently taken their place, so might for this purpose some of Italy's be called upon, or for a larger supply many from Hungary or other parts of the Austrian Empire, but their greatest competition will finally come from the vineyards of Australia, which surprised all by the variety and excellence of their exhibits in this and the following class. The Riesling, Chasselas, and Verdelho grapes, wines of which were presented from the Beechwood, Geelong, Goulburn, Melbourne, and other districts, have retained that delicate flavor which distinguishes these above all other wine-grapes of their kinds, and have added to it a certain richness apparently very peculiar to the new and dry climate to which they have been transplanted. While a number of these samples had suffered from the long trans-



portation, and had been exposed too much to changes of temperature, the majority gave evident proof that the vine-growing interests of the Australian Colonies are in very experienced hands, and that their future success will justify the brightest hopes.

The United States rank next among the countries which have, in the last decade, devoted their attention successfully to wine-growing. Eleven States were represented,—California by nine exhibitors, with forty-eight varieties of still and sparkling, dry and sweet wines; Florida by two exhibitors of orange wine; Illinois by one, with four brands of grape wine; Indiana by one, with two brands; Iowa by one, with seven varieties; Michigan by three exhibitors of nine varieties; Missouri by two, presenting eight brands; New Jersey by four, exhibiting twenty-three kinds of wine; New York by three, presenting eighteen different brands; Ohio by four exhibitors of twenty-nine varieties; Pennsylvania by one, with four kinds. In all, there were thirty-two exhibitors of one hundred and fifty-four varieties and vintages.

The unfavorable condition of the premises at the disposition of the Judges for sampling these wines, put them to a very severe test.

Many varieties of imported, native, and hybrid grapes have been experimented with, but so far, in the Eastern and Middle States, the Catawba has outstripped all others as a favorite for white table-wine. The Delaware would precede it in quality but not in quantity. The Martha and Taylor, cultivated in Hermann, Missouri, furnished at least two other samples. In the Pacific States various native and foreign grapes produce well-estimated white table-wines; as the most successful among those exhibited may be mentioned the Cucomungo, cultivated at San Bernardino, the dry Muscatel, the Rose of Peru, and the Riesling, presented from San Francisco, and that composing the white wine of San José, New Almaden.

South America sent wines from her eastern and western shores. On the latter, Chili is represented by seventeen producers, exhibiting forty-five samples of various kinds of wines. The best white table-wines of those laid before us came from J. T. de Urmeneta, of Limache, and Chacra de Ochagavia, of Santiago. These wines were excellent in character and bouquet, really *süffig* (good to drink), as the Germans would say. They give a high idea of what wine-culture might produce on the Pacific slope of the Andes, under proper treatment and with superior knowledge.

From the Atlantic coast of South America, the Argentine Republic set before us one hundred and eleven different vintages, produced by fifty-eight exhibitors, most of which showed that good grapes, and

plenty of them, are undoubtedly raised in the valley of the La Plata, but that the art of wine-making is there still in its infancy. Many of the wines from this section arrived in a damaged condition, and a large part of those that might have been considered sound had a peculiar earthy flavor, which would make them unfit for the markets of the world. Still, some of the white wines exhibited by Francisco Alvarez, from Mallingasta, and Bonifacio Davila, from San Nicolas, of the Province of Rioja, also those of Hilario Lemaistre, of the Province of Mendoza, would stand well among the wines of this class from any country. Were the young wines of that country treated with the care and in such a manner as they are in Xeres and Madeira, or in Cette, they would prove no mean rivals to those coming from these places.

Some still white wines were exhibited from our northern neighbor, Canada, but not having been present at their examination, I can only allude to them here.

#### CLARETS.

France occupies in regard to light red table-wines the same position which Germany does in the line of hocks,—the front rank; and while, as I shall detail, other countries produce many valued wines of this class, hers still furnish the standard for all. Germany, Austria, Hungary, and especially Italy, presented samples entitled to high consideration in this respect, but the reports on these not being in my hands, I have to confine myself to this mention. Spain, among her many red wines, has some in her northern provinces, and particularly in the Val-de-Peñas, deserving to be classed with the best; and Portugal presented a number, which, by mildness and bouquet, as well as by cheapness, answer all reasonable demands.

The Burgundies, Pineau, and Hermitage, from several districts in Australia, exceeded all expectations.

In the United States, good dry red wines were presented from Buena Vista, Sonoma, and San Francisco, California, of the Zinfandel, and other grapes not named; from Hermann, Missouri, and Kelly's Island, Ohio, of the Clinton and Jones Seedling; and from Hammondsport, New York, and Middle Bass Island, Ohio, from the Norton's Virginia Seedling, the latter appearing to especial advantage. The Concord, manufactured into a light red wine in many places, recommends itself more by cheapness than by quality.

Among the clarets of Chili, those of Francisco Rojas, in Salamanca, B. Dupach, in Limache, and Campora Brothers, of Santiago, surpassed

the rest sufficiently in purity of taste and delicacy of flavor to allow a fair estimate of what might be attained there.

To the majority of the clarets of the Argentine Republic the same remarks are applicable as to their white wines, even in a higher degree. Most of the samples submitted were in bad condition, and had a disagreeable taste, but the Bordeaux of Miguel Pouyet, of the Province of Mendoza, and of José E. Doncel and Francisco M. Coll, of the Province of San Juan, proved that clarets can be produced in the Argentine Republic which will answer all reasonable expectations. In a general comparison of the wines exhibited by the two last-named countries, I might venture to say that the climate and soils of Chili seem to favor more the culture of grapes producing red wines, while on the east coast, in the Argentine Republic, especially in the Provinces of Rioja and Catamarca, white wines would succeed the best.

Of the following four classes of wines, the heavy or strong, white and red, dry and sweet, I may speak at the same time, as the same countries produce all four, and these characteristics are frequently blended in their wines.

Many of the best wines of Portugal, from which we had such a splendid selection, particularly those usually denominated port wines, from Porto, can neither be called red nor white, dry nor sweet; they are a happy union of all these qualities, and rank deservedly among the most delicious products of the vine.

As strong dry white wines, strictly speaking, those from the island of Madeira have no superiors in the world; and the Malvasia and Muscatel, from the same island, merit the same distinction among the sweet wines. The wines from Portugal seemed to be the only ones which gained in delicacy after the age of forty years. The wines from Xeres, Spain, excellent as they are, and as deserving of their high repute as any, fail to retain these fine traits in their old age, and become too *quinado* (tart). Among their younger vintages, we found many which would, in the condition in which they came for presentation, be unfit for foreign markets. Still, among the hundreds of Spanish wines from all parts of the realm which I examined, there was such a variety in kinds and qualities that every taste will find plenty there for its satisfaction, and the most minute investigation will assign the kingdom its accustomed place in the front rank of wine-producing countries.

The third star of first magnitude in this constellation is Italy. From the vineyards nestling in the southern slopes of the Alps to those on which Vesuvius and Mount Ætna shed their flames, there is such a diversity and continuance of wines, celebrated by the songs

of generations upon generations of poets, that it would be superfluous to add a word to their general praise. Those which I had the pleasure to assist in examining maintained, to a satisfactory degree, the good fame of their beautiful country.

The Russian wines, from the Crimea, were also judged, and should be reported upon, by others.

Two other wine-growing districts, famous for many years, had their representatives at our Centennial Exhibition, and it gives me pleasure to bear testimony here to the maintenance of their well-earned reputation. These are the wines from the islands of Samos and Cyprus, Macedonia, Broussa, and other parts of the Ottoman Empire, and those from the Cape of Good Hope, separated from the former by the length of an entire continent, but represented here by thirteen producers of twenty-six varieties of wine, in the majority as rich and delicate, and as varied in character, as could be gathered in any southern climate in the same number.

The United States introduced also some wines of a heavy character, but it is only to the Muscatel, the Angelica, and one of the ports from California that we can accord much praise.

#### FRUIT WINES.

Wines from other fruits than grapes were comparatively sparsely represented. From the United States only one good champagne cider, from Long Island, and one blackberry wine from New Jersey, came under my observation which deserved mention. There were also exhibited one elderberry wine, from Michigan, two currant wines, from Michigan and New Jersey, and one gooseberry wine from the latter State, neither of such quality as would recommend itself.

Florida furnished two samples of orange wine meriting an award.

I was not present at the examination of the Canadian exhibits in this line, but at those from the West Indies, Cuba, Jamaica, New Zealand, and Mexico I was, and can speak well of the orange wine from Cuba, less so of that from Jamaica, and quite well of the quince wine from Mexico.

But the best of all fruit wines presented were, beyond any doubt, those from James Smith, of Nelson, New Zealand, Australia, whose still hock made from gooseberries, apple wine, gooseberry blend, and gooseberry wine, plum blend, excelled all similar productions.

#### SPARKLING WINES.

The leading country in this class of wines is, and will be for a long

time to come, the one which has given them their name (Champagne), and whose wines are, for many reasons, the best adapted to their manufacture—France. Germany will of right claim the next place in this scale, and is entitled to it by the excellence of its sparkling Moselle, Rhine, and Main wines. Austria sent some sparkling wines from Styria. Italy exhibited seven different brands, but not having conducted the examinations into their special merits, I can only mention the satisfaction derived from having assisted at the tasting of a number of them. Spain exhibited from five factories in Reus, Gerona, and Barcelona *vino espumoso*, of which but one or two could pass muster satisfactorily. The only sample of sparkling wine produced by Portugal did not at all come up to the standard of their other wines. Chili sent from three houses five vintages of a natural champagne, called Chicha, which is not only very pleasant and delicate but also very cheap.

For an industry of but a few years' standing, the adaptability of which was largely experimental, the United States has taken great strides in the manufacture of sparkling wines. Ten firms exhibited thirty varieties, of which fourteen were found meritorious enough to warrant recommendation for awards to seven of their makers.

#### DISTILLED LIQUOR.

Of the numerous exhibits of distilled liquors of all kinds, from France, Portugal, Great Britain, Denmark, Russia, Holland, Belgium, and Switzerland, I cannot speak, not having been present at their examination. Those of Germany, Italy, and Turkey I assisted in examining, and had also the pleasure of participating in the examination of those of Mexico, the English Colonies, Chili, and the Argentine Republic. Part of those of Spain and Brazil I examined in chief, also those of Sweden and Norway.

Among the fifty-four varieties distilled by forty-three Spanish manufacturers, I found eleven of such excellence as to merit an award, and many others of careful and good distillation. Most all the popular styles of liquors were comprised in the selection offered, but the "Anisados" were the most frequent, and in richness and treatment very remarkable.

The same taste seems to prevail with the Scandinavians. The six exhibitors from Norway produced, among sixteen samples, some very finely-distilled aguavite of this kind. The "punch" of various flavorings, principally made of arrack, was also so well manufactured as to justify awards to four of the six distilleries above mentioned.

In Sweden the distilling of cordials appears also to rank quite high, twelve firms exhibiting twenty-two kinds, mostly punch, which were nearly all good, and five were so excellent as to merit awards. The spirits produced by Mobada Fabriks Bolag, from reindeer-moss, and the various modes of treatment in fermentation, were as interesting as the quality of the product presented was superior.

Last, though not least, of the European countries competing in this branch of industry, I have to mention Turkey, which presented some six peculiar and very fair liquors from Crete and Samos, also alcohol of great purity.

Of liquors from Mexico and from the English Colonies, we examined forty-three, mostly rum, from twenty-eight plantations in Jamaica, and grape-brandy from the Cape of Good Hope.

Australia sent from two distilleries in Melbourne and Ballarat, in Victoria, seven samples of spirits, whisky, and Geneva, which compared well with those from the mother-country, especially the last. South Australia was represented by three houses from Adelaide with fourteen liquors of current kinds, showing their preparation to good advantage. Queensland entered this field with four samples of rum from the same number of makers, of which one only excelled by a higher grade of distillation.

The greatest variety of liquors from different materials was presented by Brazil; but I examined only the plain liquors, those not cordialized. They came from thirty-nine factories, comprising sixty kinds, from the plain cane-spirit and rum to the finer Laranginha,—liquors distilled from plums, caju-fruit, honey, and grapes, gin, arrack, and alcohol, some of which were offered at surprisingly low prices. Ten of the distillers were recommended for awards.

From Chili we examined eighteen brands of liquor, manufactured by five distillers, of which four were of sufficient merit to entitle them to awards. The selection contained some Cognacs well worthy of consideration.

The Argentine Republic exhibited eighty-two kinds of spirits, prepared by forty-two manufacturers, among which were some distilled from bitter-oranges, cacao, and of oranges, sugar-cane, grapes, and in the style of Chartreuse, which would successfully compete with the best.

#### FRUIT-SYRUPS, JUICES, AND EXTRACTS.

Among exhibits not belonging to the wine and spirit section, but to the group in general, I examined the limited number of fruit-syrups and fruit-juices furnished from Germany, Turkey, Brazil, Chili,

the Argentine Republic, Australia, and the United States, and found only raspberry-syrups, and, in the tropical countries, lime-juice, of a quality to be specially recommended. The syrups of grapes from the Argentine Republic, the majority of which were examined by others, appeared to me very meritorious. In this whole range of fruit-extracts, the United States produced little that was not spurious, or imitation, and inferior; in proof of which might be mentioned the poor character of the so-called fruit-syrups which were palmed off on the public from the Centennial soda-water stands.

Fruit-jellies, soup, and extracts of meat, manufactured by seventeen firms in the United States, some having as large a selection as twelve different kinds, were also examined by me, and I had the pleasure to be able to report favorably on eleven of the number of exhibitors.

Ginger-ale, the manufacture of which has but lately been introduced into the United States, made its appearance in one sample, and I found it deserving favorable mention; also, extract of hops, of which I can say the same. Finally, I may mention as having reported on the result in detail on an examination of eleven exhibits of malt from the United States and six from Canada; also, four of hops from the former and seven from the latter country.

I have the honor to be respectfully yours,

GUIDO MARX.

Having no personal knowledge on the subject of liquors, beyond their chemical composition (and this is not admitted as a standard of excellence), I submit the foregoing report of Mr. Marx on his acknowledged reputation as an expert in such matters, and commend it as a fair statement of facts.

## ITALIAN WINES.

BY G. F. SECCHI DI CASALI.

I have the honor to submit the following observations upon the wines of Italy, their production, and commercial value.

The vine (*Vitis vinifera*) is cultivated from one extremity of the Italian Peninsula to the other. In some provinces, situated principally on the slopes of the Alps, its cultivation is attended with but little success, and the same may be said of places where the inclination of the land is not sufficient to produce favorable results; there is not a province in Italy, however, which is not rendered attractive by the luxuriant growth of the vine.

On the plains of the northern provinces it has a vigorous, free, and

prosperous growth. Production is abundant on the hills of Monferato and Veronese, in Tuscany, Amelia, and in Central and Lower Italy, extending from the provinces of Rome as far as Trapani, in Sicily. Excellent wines are produced on the plains, but superior qualities of every denomination and grade, viz., dry, strong, sweet, of body and good color, of very low prices, are grown on the hill-sides.

Formerly the Italian wines were sent to the Levant, and, by means of the Venetian merchant marine, were scattered throughout the world. After the fall of Italy, however, with the general paralysis of commerce and industry, the cultivation of the vine ceased, and the art of wine-manufacture was neglected. In consequence of the improved condition of Italy, a few years later, more attention was paid to this important agricultural industry, and it was not long before Italian wines found their way to foreign marts. If they have not the fame of wines of other lands, the fact may be accounted for by reason of the Italians being as yet novices in the manufacture of wines; and in the course of time they may succeed in competing favorably with the producers of other nations, to whose long experience may be attributed their success.

Upon the slopes of the larger spurs of the Apennines and the Alps are produced wines which may be put in competition with the best wines of France, having not only the same qualities in point of taste, but the ready perfume. The fact is well known that in Lower Italy the preferred Spanish wines are excelled. The real fault to be found with Italian wines is in their commercial type; but the subject is being studied in Italy, and, through the united efforts of the scientists and producers, they will be enabled in the contests of the future to attain success over other nations for cheapness and stability. It may be seen that the exportation is already considerable by the following observations recently published in a report of the Minister of Agriculture, Commerce, and Industry of Italy:

During the years 1870-74 the exportation of Sicilian wines was estimated to be between 91,000 and 151,000 hectolitres; of the Neapolitan, between 65,000 and 80,000 hectolitres; of the wines of Piedmont, between 41,000 and 52,000 hectolitres; of Venetian wines, between 1000 and 10,000 hectolitres; of the wine of Tuscany, between 2000 and 13,000 hectolitres; of the Roman wine, between 1000 and 6000 hectolitres. The hectolitre equals about 26 gallons. The total annual production of Italy is nearly 28,000,000 of hectolitres, Italy ranking fourth among the wine-producing nations of Europe.

The greatest wine-producing provinces of Italy are the following, in diminishing order, viz.: Palermo, Alessandria, Florence, Trapani,



Teramo, Torino, Bari, Catania, and Venice. The smallest crops are obtained in the provinces of Livorno, Sondrio, and Grosseto. The area of lands in Italy devoted to grape-culture is estimated to be 1,870,109 hectares. The best crop, per hectare, is found in the provinces of Alessandria, Siracusa, Cuneo, Torino, Novara, Messina, Caltanissetta, Girgenti, and Crapani; the poorest crops being in the provinces of Treviso, Udine, Venice, Rovigo, and Arezzo.

Nearly all of these wines were represented at the Exhibition in Agricultural Hall, and many of them were highly praised and recommended for award by the Judges and experts of all nations.

The Italian agricultural section comprised 190 exhibitors of wines, who displayed samples of 350 different varieties. Particularly qualified for exportation, and deserving to be generally known as table-wines, are those of Verona,—white and red; the clarets of Baron Ricasoli, of Sienna, Tuscany; those of Don Gagliasso, of Masserano, Piedmont; of Cianfanelli, of Livorno; of Marquis Tanari, of Bologna; of Zeno dei Coronei, of Calabria; and the Sardinian wines of Marquis Villamarina. The quality called “Barolo,” of the firm of Bosco & Ternavasio, the wines of Facciotti from Gattinara, those of the Societa Enologica Valtellinese, of Gianoli Bros., of Ghemme, Piedmont; some of those exhibited by the Societa Partanopea, and by Giuseppe Scala, of Naples; the wines shown by Barone Ricasoli, and Chianti, of Cianfanelli, in Tuscany, by Manissero Bros., by Ravinale d’Alba, and by Colorinatti, of Chieri, in the northern part of Italy, and other superior qualities, too numerous to be mentioned, should be included among the best productions of this industry. Some of their number are without a rival, such as the “Marsala,” which is known in every part of the world, the “Lachrymæ Christi,” and all other qualities of wine of the Vesuvius, the Barbuzzo di Calabria, the Guizano of Rome, the Capri,—white and red,—the Moscato of Siracusa, the Malvasia of Lipari, the Falerno, and the wines of Pompeii. Nor is there a lack of sparkling wines in Italy; some of which are produced from grapes in no way inferior to those from which champagnes are made in other countries. Victor Grand Perrin di Ozzano exhibited a delicious quality, and an award was unanimously decreed in his favor by the Judges.

The great work of gaining a reputation for wines abroad has only lately been inaugurated by the producers. Societies ought to be formed whose aim it should be to extend production, improve the cultivation of the vine and the systems of manufacture, and reduce the number of qualities to those which are most adapted for exportation. If those points are successfully carried, Italian producers

will derive a great benefit from their participation in the Exhibition, and their ends will be furthered by establishing an agency for the sale of Italian products in the United States.

At present the importation of Italian wines in the United States amounts to but little as compared with that of French wines, and has been limited until now to those qualities which were noted by Americans during their travels in Italy, or to which attention was called by Italians residing in the United States.

Nearly all Italian wines are fit for exportation, and will keep in any climate without requiring to be strengthened with alcohol. They are really worthy of recommendation, and their use in the United States would have the beneficial effect of reducing the use of alcoholic liquors. Wine does not depress the mind of man, but gives him energy and courage, and renders work a pleasure. Of course, it must be taken in moderation, and must be well made and free from all spurious substances. Then the wine has the property of strengthening the stomach, facilitating the digestion, favoring perspiration, reviving the prostrated strength and functions of body and soul, contrary to the effects of all other beverages, natural or artificial, as beer, cider, tea, coffee, and a vast number of others which exercise an evil influence on the constitution of man, and leave him in melancholy spirits.

During the Exhibition it was the desire of the Italian Enological Committee of Torino to test the judgment of the American people in regard to wine. The sampling in the room erected for that purpose in Agricultural Hall was attended with remarkable results. Samples were also distributed among the principal houses of Philadelphia, and numerous orders were received by the producers of wine in Italy.

Mr. A. M. Gianelli, General Agent of the Italian Executive Committee, has discussed the subject of Italian wines at considerable length in his report, and, feeling much interest in the matter, I also reported to Baron Alberto Blanc, Royal Commissioner, on the improvements essential to the successful development of this industry, with suggestions in reference to open trade with the United States.

### BREADSTUFFS.

In the two lines of substantial food, bread and meat, the Exhibition made a good display. Nearly all the civilized nations of the earth had on exhibition the raw material of bread in the form of some of the cereals. While there was shown a considerable diversity in the same species of grain produced in different countries, under different climatic influence and modes of cultivation, yet the

general similarity maintained in the same species of grain from the extremes of the earth was surprising, and in a striking manner shows the tendency to resist modifying influences and preserve the unity of the species. The limits of this report will permit us to notice only a few of the peculiarities arising from local influences as they were observed in this section of our work.

Wheat from Southern Europe and from the south of the United States was noted for the small size and almost transparent flintiness of the grains, showing a large proportion of gluten and a relatively small amount of starch, thus specially adapting it to the manufacture of macaroni and other pastes. The wheat on exhibition from Canada, the northern and central parts of the United States, Russia, Germany, and the Scandinavian countries presented a larger grain, with a preponderance of starch in its composition, and yet showed a fair proportion of gluten in the cortical portion of the grain. The Pacific coast of the United States, the British Islands, and Australia exhibited a peculiar type of wheat. The grains were very large, light-colored, and comparatively soft, showing the great amount of starch in their make-up. These peculiarities mark the influence of cool, moist summers,—the effect of an oceanic climate. The difference between spring and winter wheat is well shown in the subjoined report of Mr. Walter S. Greene, who had charge of the examination of flour:

PROF. R. T. BROWN, *President Group IV., International Exhibition*:

SIR,—The Judges selected for the examination of flour beg leave to submit the following general report:

In the first place, we deemed the magnitude of the industry demanded the procurement of the most scientific experts to be obtained in this country. We therefore secured the aid of J. H. Herrick, Esq., of the New York Produce Exchange, and Daniel Lagen, of the Philadelphia Board of Trade, gentlemen recommended by the leading members of the exchanges as high-minded, honorable men, and among the very best judges of flour of their respective boards.

A room was assigned us in Agricultural Hall, where a good light was obtained and uniform samples of flour taken for examination. The flours were divided into six different classes, viz.:

#### WINTER WHEAT FLOURS.

1. Flour containing a large amount of gluten and little starch.
2. Flour possessing a large quantity of starch and little gluten.
3. Flour possessing about equal amounts of gluten and starch.

## SPRING WHEAT FLOURS.

4. Flour containing a very large amount of gluten, made from purified middlings, and known as "Patent Flour."

5. Flour made from hard spring wheat in which the middlings are first taken out, purified, reground, and mixed with the flour produced on the first grinding.

6. We found a large quantity of flour where the kind of wheat used was uncertain and the method of manufacture unknown. We made a class of these flours, calling them "Family Flours," but not of the highest grade.

We adopted a standard in each class, in color and dressing, to which each sample must reach to entitle it to further examination. After getting together the different flours which were entitled to a further examination, we submitted each to a doughing, using the same quantity of water, in order to test the strength and color. None of the Judges or experts were to know whose flour was being examined, or the opinion of his associates, until all had marked their opinion of the sample under examination. These markings were then added together, and determined the excellence of the flour. By adopting this system we were enabled to pass an opinion based upon merit alone, entirely free from any prejudice as to countries, individuals, or methods of manufacture. There were about two hundred and seventy samples of flour upon exhibition, from the following-named countries, divided as follows:

United States . . . . .	75	Portugal . . . . .	37
Great Britain (embracing flour from		Russia . . . . .	8
Canada, Australia, New South Wales,		Austria . . . . .	9
Queensland, and Cape of Good Hope)	70	Argentine Republic . . . . .	25
Sweden . . . . .	12	Chili . . . . .	9
Mexico . . . . .	1	Africa . . . . .	2
Spain . . . . .	15	Netherlands . . . . .	1

Of class 1, flour from winter wheat, possessing a large amount of gluten and little starch, the finest were from Missouri, Ohio, and the District of Columbia, in the United States, and Austria. Sweden also showed some excellent flour in this class.

In class 2, flour from winter wheat, possessing a large amount of starch and little gluten, there was a large representation, Sweden, Canada, and South Africa, and New York, Ohio, and Oregon, in the United States, standing foremost.

Of class 3, flour from winter wheat, possessing about equal quantities of gluten and starch, Chili, Portugal, Russia, Canada, Austria,

Spain, and the Cape of Good Hope, and Missouri, New York, and Pennsylvania, in the United States, were the most notable.

Of flour made from spring wheat, Canada and the State of Minnesota were about the only exhibitors. Minnesota stood pre-eminent in point of excellence of material and beauty of manufacture.

4. The flour made from the purified middlings of hard spring wheat was very fine, and the State of Minnesota had a large exhibit. This flour is both white and strong, possessing a large quantity of gluten. As a bread-making flour we consider it par best excellence, making the largest number of pounds of fine bread from a fixed number of pounds of flour, retaining its moisture a long time, and being very sweet and wholesome.

5. The exhibition of spring wheat straights was confined mainly to Canada and the State of Minnesota, those of the latter being far superior in color and strength.

Within the last six years there has been a marked improvement in milling in the United States, more especially in the manufacture of spring wheat flour. The finest flours made in the United States are now made from spring wheat. These fine grades are known as "Patents," and are made from the middlings of hard spring wheat. In former years the middlings made the darkest and least valuable flour, and the aim of all millers was to grind so as to make as little as possible. Now, since the introduction of the middling purifiers, the entire system of milling has been changed, and all millers are striving to produce the largest quantity of middlings possible. Slow grinding and smooth stones have taken the place of rapid grinding on rough-faced stones.

The introduction of the middlings purifier has been of great benefit to the Northwestern spring-wheat-producing States, placing their main product, spring wheat, in the foremost ranks of wheats, from which are made the finest grades of flour. During the last ten years the best inventive talent has been at work producing improved wheat-cleaning machines, smutters, separators, etc. Emery-machines for dressing millstones have been introduced with marked success. Middling purifiers have become a necessity, and are being manufactured largely and put into nearly all first-class flouring-mills.

Mammoth mills are being built in nearly all the States, and the manufacture of flour bids fair to become one of the leading industries of this country.

Respectfully your obedient servant,

WALTER S. GREENE.

## INDIAN CORN.

The exhibit of Indian corn (maize) is proof of the almost universal distribution throughout the civilized world of that native American grain. The only conditions limiting its successful cultivation appear to be a mean summer temperature above 60° Fah., and a supply of moisture either by rain or by irrigation. These conditions being filled, almost any soil, by proper manuring, may be made to produce this cereal abundantly. A remarkable feature observed in the corn exhibit is the fact that Southern Europe, tropical America, and Australia showed, almost exclusively, the small "flint" varieties of corn peculiar to the New England States and Canada. The large ear and deep grain produced so abundantly in the Western and South-western States of this nation were scarcely seen in any exhibit from elsewhere. Excepting the British Islands and the Scandinavian nations, maize, or its products, were found everywhere in the Exhibition. The wide range of adaptation in this grain to different forms of food was finely exemplified in the several grades of corn-meal and flour as bread material, and the various forms of hominy, grits, corn, farina, and soft, or "roasting-ear" corn preserved by canning. In all climates where it can be grown Indian corn is the chief dependence in the production of pork.

## OATS.

The northern latitudes of both continents exhibited a great variety of food materials manufactured from oats. This grain has long been an important element of cheap food for the peasantry of Northern Europe, but its introduction as an article of human food on this continent is of quite recent date. Oregon and Canada exhibited samples of oatmeal and grits that compared favorably with the Scotch and Irish oatmeals so widely known and admired. Fair samples of this grain grown in New England and Northern New York were exhibited, and several large establishments in the vicinity of New York City, and at other points in the Eastern States, are engaged in the preparation of oats for food. One mill at Portland, Oregon, is very extensively engaged in this manufacture, using exclusively home-grown grain. The general introduction of oats as a food material for the masses would be an important change in our national bill of fare. It is nutritious, easily digested, and withal quite as palatable as any other form of cheap food.

Rye and barley were on exhibition only in limited quantities, and formed by no means a prominent feature in the general grain exhibit.

## RICE.

Rice, both from the American and Asiatic fields, was on exhibition, but the display was not in proportion to its importance in the food supply of the world.

## STARCH.

Though but indirectly connected with this subject, it will be proper to notice here the large and beautiful display of starch on exhibition. This was chiefly manufactured in the United States, and made from the large porous-grained Indian corn so extensively grown in the Mississippi Valley. But few persons are aware of the extent of this manufacture in the United States. Many of the factories, both in the East and in the West, consume one thousand bushels of grain per day, and some even more. Starch is extensively used in the finishing of bleached and printed cotton and linen goods; and the domestic consumption of this article, which, but a few years ago, was supplied by home manufacture, is now furnished, almost exclusively, from the factories, the demand thus continuing equal to the supply, large as it is.

## GRAIN.

We subjoin the following report from Colonel Bradford, who had charge of the examination of grains, etc.

TALLAHASSEE, FLORIDA, September 22, 1876.

SIR,—I have the honor to submit my memoranda of examinations made as chief of the section of Judges to whom was referred the subject of cereals, grasses, and forage plants. There were examined about 5220 exhibits of grain, including wheat, rye, oats, barley, buckwheat, corn, rice, and grasses, one-third of which were collective exhibits. In conducting the examination the following points were considered, viz.: weight, size, uniformity, truth or genuineness, and cleanliness of grain. For wheat, the standard of weight was taken at sixty-two pounds per bushel, and none of less weight was recommended, except from Portugal and the Netherlands. Those recommended from Portugal, although good in every other respect, were wanting in weight, sixty pounds per bushel being the standard used for them. This lightness is said to be due to an excess of lime in the soil. The Dutch wheats were also judged by a lower standard of weight, as they appeared to have been placed in glass jars in a damp condition; hence the swelling of the grain, and consequent shortness of weight. As a rule, the finest wheats were from some of the Western States, Canada, and Victoria, Australia. The grains from

these countries also show the great degree of perfection reached in machinery for separating and cleaning grain. The Spanish, Mexican, Egyptian, Turkish, and some of the Russian grains show a need for this machinery. Rye was about the same everywhere. Oats varied greatly in weight, viz., from twenty-eight to fifty-one pounds per bushel, the highest weights being from Canada and New Zealand. Barley, the production of which is extending rapidly, does not show a very decided difference in different localities, the principal difference being in the manner of cleaning. Indian corn was exhibited from several foreign countries and from nearly all of the United States, but none compared with that from the great corn-growing West, particularly the State of Iowa, which exhibited seventy-four varieties, some of which, on stalks seventeen feet high, yields, without manures or fertilizers of any kind, one hundred and twenty bushels per acre, and others yielding sixty-five bushels of matured corn per acre in ninety days from the time of planting.

Very respectfully,

JOHN BRADFORD.

#### PRESERVED MEAT.

Meat, preserved in several modes, was extensively exhibited. The ordinary forms of mess-beef and pork, packed in barrels, and preserved with brine, were exhibited by several packing-houses in the United States and Canada. Most of the samples examined manifested a high degree of skill in the business, and presented the meat in a perfect state of preservation, yet not so saturated with salt as to be unpalatable. Canvased hams from Canada, Cincinnati, and Baltimore were deserving of special mention for their excellent flavor, as well as for the neat and secure manner in which they were presented in the market. A great variety of fine cut-meats, in the form of sausages, on exhibition from Italy and Portugal, attracted general attention. These were chiefly made of pork, variously seasoned, and generally dried without smoke, and were put up in membranes, in packages of various forms and sizes. The method of preserving meat in a fresh condition, in vacuum cans, is extensively adopted, and, if we may judge from the specimens submitted to our inspection, is in the main successful. Roast beef, boiled corned beef, roast venison, lamb, and fowl were among the samples of canned meats examined, and most of them were found in excellent condition, even after long sea-voyages, to which many of them had been exposed. The United States, Canada, Russia, Sweden, and Norway were prominent as exhibitors in this important line of industry.



## PRESERVED FRUITS AND VEGETABLES.

Fruits preserved by canning were on exhibition in great abundance and variety. The discovery of the French chemist, François Appert, only about forty years ago, appears to have become known and adopted in all civilized countries. It possesses great advantage over every other method of keeping fruits and garden vegetables, from the fact that the peculiar flavor of the articles may be preserved for an indefinite period. Peaches, pears, plums, cherries, and the various forms of berries were prominent among the canned fruits exhibited. In the line of vegetables, preserved by the same process, green corn, peas, beans, and asparagus were exhibited in great abundance, and generally in a good state of preservation. Though these goods, both fruits and garden vegetables, were very generally exhibited, yet the United States and France evidently led the exhibition in this line.

Fruits preserved in sugar were exhibited in great variety and perfection. In this department of fruit confectionery, France and Italy excelled, both in beauty and variety of products, though the exhibits of several other countries were very creditable. In dried fruits the exhibition was quite limited in quantity, the canning process having largely superseded it. Several samples, however, of apples, peaches, and pears, dried by the Alden process, were on exhibition and attracted much attention. The fruit appeared to have undergone but little change in the drying process, except the loss of water. Raisins from California were exhibited which, for size of berry and fine flavor, compared favorably with the best productions of foreign vineyards.

Class 623, embracing tea, coffee, and tobacco, was added to the work originally assigned to Group IV. some weeks after we had commenced our labors.

## TEA.

The exhibit of tea was not large either in quantity or variety, and was almost exclusively the production of Japan, China, and Brazil. Japan exhibited several very fine samples of pure tea-leaves, without coloring or dressing of any kind, which were, with good reason, very highly commended. The Chinese teas were finely-prepared samples of the familiar varieties of green and black tea. The Brazilian tea was from a native plant, the *Maté Paraguaiensis*, the leaves of which were pulverized and put in small tin boxes. The taste and odor of maté very much resemble those of the Chinese plant, and in chemical composition the resemblance is even more marked. It is a

curious fact that the natives used a decoction of maté as a diet drink before the continent was visited by Europeans.

### COFFEE.

A few samples of coffee were exhibited by several tropical countries, but the principal exhibit in this line was from Brazil. This great tropical empire furnishes nearly half the coffee of commerce, though it is but little more than a century since the coffee-plant was introduced. The great variety and excellent quality of the specimens of coffee in the Brazilian exhibit astonished many experts who examined them. The popular opinion that the Brazilian coffees are of a low grade was very emphatically contradicted by the coffee presented to us for examination. I learned from good authority, however, that the fine specimens exhibited in Agricultural Hall were but fair samples of a large amount of coffee annually exported from Brazil and sold in the markets under more popular names. The samples of unhulled coffee in the Liberia exhibit, together with the process of hulling, and the machinery for that purpose, which was in operation much of the time, attracted the attention of many visitors. The coffee itself was remarkable for the large size and fine flavor of the berries. The samples exhibited give hopeful promise that, with proper skill and industry, coffee may become a source of great wealth to the infant republic of Western Africa. The adaptation of climate and soil to this production is indicated in the fact that the coffee-plant is native to the highlands in the rear of Liberia.

### TOBACCO.

Tobacco was exhibited in a variety of forms, and in great profusion. General Imboden, who was transferred from Group XV. to assist in the examination of tobacco, had charge of the work, and submits the following report of the labors of his section :

UNITED STATES CENTENNIAL EXHIBITION, 1876.

PROFESSOR RYLAND T. BROWN, *Chairman Group IV.*

SIR,—Having been assigned by order of the Chief of the Bureau of Awards from Group XV. to Group IV. to assist specially in the examination of the tobacco in the Exhibition, I have the honor to report that on the 27th of June the Committee of Group IV. designated to co-operate with me in this special department entered upon the active discharge of their duties, and have been constantly and diligently at work ever since. Herewith you will find the special report in every

case wherein the Committee deemed the exhibit worthy of the Centennial medal. Where an exhibit fell below the standard fixed by the Committee it has been passed by without comment.

The tobacco exhibits examined by the Committee were exceedingly interesting. They showed the wide-spread cultivation of this article of perhaps mere luxury, from the tropics to the fifty-fifth parallel of latitude, and the Committee have noted with interest the effects of climate, soil, elevation above the sea-level, modes of culture and of curing, in modifying the growth and qualities of a plant essentially the same in its leading characteristics, but which, under these modifying influences, presents now widely-distinctive varieties and striking peculiarities, which enable the expert to discover in the sample its geographical origin with the unerring certainty of the anatomist in assigning any single bone shown to him its proper place, genus, and species in the animal kingdom. The taste of tobacco-consumers in chewing, smoking, and snuffing, is as widely distinctive in the world as the varieties in the crop; and the manifold forms of manufacture have conformed to these diverse tastes in the treatment of the commodity from the fields of its growth to its final preparation for the consumer. It will be readily understood that under these circumstances the duties of the Committee were arduous, delicate, and often difficult, as they could adopt no invariable standard as a test of excellence all the world over, for no such standard would have been universally applicable. The Committee, therefore, were guided to their conclusions in regard to individual and governmental exhibits by ascertaining the place of consumption of the article under examination, and determining its comparative excellence by the standard of taste prevailing there; and so treating it as in competition chiefly under that standard. That this was the only practicable mode of doing justice will be apparent from an enumeration of the countries exhibiting tobacco and machinery and appliances used in its manufacture. They are the United States, Spain and her possessions, Cuba, and the Philippine Islands, Russia, Brazil, Germany, the Netherlands, Japan, Canada, the Argentine Republic, New South Wales, Jamaica, Cape of Good Hope, Queensland, Switzerland, Belgium, Turkey, Egypt, Greece, Chili, Norway, Portugal, Mexico, and England. From many of these countries the exhibits were numerous, including tobacco in the leaf, in bulk, plug for chewing and smoking, cigars of all grades and classes, cigarettes in many forms, straight cut, curly cut, perique cut and granulated for cigarettes, fine cut for chewing, etc. Some idea of the commercial importance of tobacco-culture may be formed from the simple fact that the United States for the fiscal year ending

the 30th of June, 1874, derived a revenue of \$6,150,060.41, gold, in duties paid on imported tobacco, cigars, snuff, etc., and \$33,242,875.62, currency, from internal taxation, making a total income to the National Treasury of \$39,392,936.03 in a single year from tobacco.

Respectfully submitted,  
JOHN D. IMBODEN.

### CHEESE AND BUTTER.

The summer exhibit of cheese and butter was made under very unfavorable circumstances, the intense heat rendering it almost impossible to present either article in a fit condition to be examined.

Notwithstanding the unfavorable temperature, Western and Northern New York and Canada made a very creditable exhibit of cheese and some very fine specimens of butter. A special exhibit of dairy-products having been announced for the month of October, it is fair to presume that most of the dairies and cheese-factories of the United States and Canada postponed their exhibits until that time. The production of butter and cheese on the co-operative or factory principle is rapidly growing into favor in this country, and it is to be hoped that it will gain a new impulse from the Centennial Exhibition.

Italy and the Netherlands had on exhibition several varieties of cheese peculiar to those countries. The Italian cheese especially presented great diversity in form, flavor, and price. Some of the samples were five years old, and yet comparatively mild and finely flavored. The Dutch cheese fully maintained their high reputation for excellence.

### BAKING-POWDERS.

Among the great variety of methods and appliances for preparing food which were exhibited in Agricultural Hall, the special points of attraction were the display of baking-powders and the methods of using them, exhibited in practical operation by the Royal Baking-Powder Company and the Rumford Chemical Works. Hecker's exhibit of self-raising flour, with the great variety of bread, cakes, etc., produced therefrom, and the process of production, drew a constant crowd of interested spectators. These small conveniences constitute an important link in the chain of our material progress.

## TEA EXHIBITED BY THE CHINESE GOVERNMENT.

BY JOHN H. CATHERWOOD.

One of the most interesting and instructive exhibits of the Empire of China, and perhaps the most valuable, because representing a principal export of that kingdom, was the unique and exhaustive exhibit of the various kinds and qualities of tea produced in the different districts. For many years very little, comparatively, was known by the outside world of the cultivation of the tea-plant, and of the preparation of its leaves for use and export; but owing to the increased privileges recently granted to foreigners by the Government, giving access to many parts of the country which had previously been sealed to their presence and observation, a great and growing interest has developed in regard to the cultivation and preparation of tea. This interest has been materially heightened of late by the rapidly-increasing addition to the world's supply of tea contributed by the Empire of Japan, which, before 1856, exported hardly sufficient to attract notice, but is now adding to the supply for consumption in the United States some 25,000,000 pounds annually. This large quantity, coming as it does more and more into competition with the teas grown in China, has naturally had great influence upon the trade, and has caused those engaged in it here to note very carefully the changes that have arisen and that are likely to occur in the future of our tea-trade with China. The opening of new ports to foreign commerce under the late treaty with England must, in the future, necessarily create an additional interest also in the trade in teas.

Canton and Shanghai were for a long period the principal export ports through which tea found the foreign markets, but the opening to foreign commerce of the ports of Foochow and Amoy to a large extent diverted the supply of black teas which had previously found their way to foreign markets through Canton; and as they also drained a portion of the country that had not previously contributed to the export trade, they thereby increased the supply for foreign consumption. Formosa, being contiguous to Amoy, finds an outlet for her surplus crop of tea through that port, and is now giving to the world an increasing quantity of delightful tea, the popularity of which is growing rapidly, and most of which finds a ready market in the United States. Shanghai, as for years past, is almost exclusively the port of shipment for green tea; and it is a noticeable fact that the character of the green teas shipped from that port to the United States has been remarkably uniform, while the character of the black teas of

China, particularly of Oolongs, has varied considerably, owing doubtless to the difference in preparation necessary to suit the altered distances from places of growth to the present ports of export,—Amoy and Foochow. There is also a noticeable change recently in the character of the Oolongs of Formosa, which exhibit a decided improvement in quality over the earlier shipments from that country.

In taking up in detail for examination the exhibits of tea from the several districts, the following features or peculiarities are noted: The samples of green teas from the Moyune district displayed the traditional reputation for superior character which the teas from this section have always maintained, to wit, rich, bright, delicate liquor, of choice flavor, which features accord to them the most attractive qualities of all the green teas. The green teas from the Taeping, Ping-suey, or even the Teenkai districts, are far less attractive in the cup, although generally superior in make of leaf. We have, however, recently been receiving some excellent teas from the Teenkai district, which have, in consequence of the care taken in their preparation, become quite popular in this country, and bear favorable comparison with those from the Moyune district.

The samples of Ping-suey teas were a fine display of the teas of that district, being of handsome style and color, and of better than ordinary liquor. We fail, however, to anticipate an increasing demand for these kinds in this country, since, owing to the abundance and cheapness of Japan teas, their use is apparently being supplanted by the latter.

The samples of Congous from the Oopack and Ningchow districts were capital specimens of these descriptions, and the demand in America for the latter kind seems to be increasing. We have no doubt that, owing to their superior qualities, they will steadily grow in favor here, and become, in time, as popular as they are in the Russian markets.

The specimens of Canton teas were very varied and interesting. The Scented Capers from the Loting and Saigon districts, and the long- and short-leaf Pekoes from the Suhing, Chunchow, and Tayshan districts, are excellent samples, and although these teas have a large sale in England they are comparatively little known or used by Americans. There would seem to be no good reason, however, why, in time, when their usefulness for mixing purposes is more generally understood, they should not become quite as popular here as they are in Great Britain. The sample of Kooloo Pekoe was of exceedingly attractive quality and particularly interesting, as such tea has not been previously known in the markets of the United States.

The Oolong teas from Amoy (of which the exhibit contained some fine samples) at one time bade fair, in consequence of the color of the leaf, their freedom from dust, and the strength of liquor, to become very popular with our Oolong tea-drinkers, their great body or strength particularly adding to their value. The demand for them has, however, been somewhat checked within the last few years by the pernicious habit of mixing inferior or Ankoi leaf with the true leaf. The Congou teas from this port were represented by some excellent specimens, but Amoy Congous have found but little favor in America, in consequence of their generally coarse and burnt flavor; there were, however, a few really good samples of Amoy Congous in the exhibit, and were we to receive these better kinds they would doubtless be esteemed.

Samples Nos. 55 and 57 represented the black teas from Tokow. These descriptions were a novelty in America, and the specimens proved to be very attractive. No. 57 was particularly fine in flavor, and not unlike some of the choice high district Pouchongs that are so much esteemed in some markets. These teas appear to be lacking only in one feature to render them very popular here, which they undoubtedly would be if the leaf was made more attractive. The leaf is too open to suit the fastidious tastes of American buyers.

The exhibits of tea from Ningpo did not display the good qualities called for by American tea-drinkers; they are too inferior both in make of leaf and in liquor to find patrons here, but the specimens were unquestionably interesting as representing what appears to be the commonest class of China teas.

The specimens from Foochow were very complete, embracing all the grades of what has been, until quite recently, the most highly prized of the black teas used in this country. It is greatly to be regretted, however, that, in consequence of the system that prevailed a few years back of mixing large quantities of dust with the leaf, they have been much ignored, and their use to a great extent supplanted by Formosa and Amoy teas, in consequence of the comparative absence in these of this very objectionable feature. An improvement in the preparation of Oolongs from Foochow has taken place recently, and will have to be critically observed by the producers in the future to re-establish their popularity.

The specimens from Swatow were very complete and attractive, and indicate that Oolong teas particularly will find a natural outlet through that port, and admit of an improvement in quality in consequence of their reaching the seaboard by a shorter route (viâ the lower watershed of the Fokien Hills) than they now have to traverse in order to

reach Foochow or Amoy. We see no good reason, therefore, why Swatow should not at an early day become the principal export port for Oolong teas.

We now come to the exhibits of the several descriptions that have attracted most attention, and with which we close our report, namely, the Brick teas. The export of these teas seems to have been almost exclusively confined to the Russian markets, and even specimens of them have but rarely been met with in this country, in consequence of which these samples have received much attention, and been rated as great curiosities. The samples comprised several grades, from choice tea to apparently very common; and while the better kinds would doubtless prove attractive to our tea-drinkers, yet it is very problematical if they would become generally popular here, since Americans exact, even in articles of food, features that attract the eye, as well as those that please the palate.

Another sample of tea that is classed by our people as curious was the "Basket tea;" this tea finds some sale in the San Francisco market, but its use there appears to be confined principally to the Chinese population of the place. Some little of this kind has found its way to the Eastern markets of the country, but it does not appear to gain favor.

Taking China's tea exhibit as the representation of a great and growing trade, and in view of the commercial importance attaching thereto, it has justly claimed its share of attention among the many strange, beautiful, instructive, useful, and curious products of the world so lavishly displayed in the Exhibition.

## DAIRY-PRODUCTS.

BY L. B. ARNOLD.

The great susceptibility of dairy-products, especially butter, to the influence of heat and atmospheric agencies, rendered special preparation for their care while on exhibition a matter of necessity. This work was assumed by the dairymen of the country, under the auspices of the American Dairymen's Association. At the annual convention of that Association held at Rome, New York, in January, 1876, eight hundred dollars was subscribed by the members of the Association to begin the work with, and a committee was appointed to prosecute the work to the end.

Money was raised by private subscription in New York, Vermont, Pennsylvania, and Ohio, and in New York by legislative enactment;



and a model butter and cheese factory, with ample rooms for the display of butter and cheese, and a complete outfit of apparatus necessary to the manufacture of both butter and cheese were erected, at a cost of ten thousand dollars. Of this sum two thousand dollars was contributed by the Canadian Government.

This structure, which was located just east of Agricultural Hall, was one hundred and fifteen by thirty-six feet on the ground, with its longest dimensions lying north and south. On the east side at either end were annexes, sixty-four by thirty feet, extending parallel to each other, giving to the ground-plan something of the form of the letter U. The lower floor of the northern annex was set apart for the exclusive use of dairy-products from Canada, and it was occupied during the entire season with relays of Canadian cheese. The lower floor of the south annex was devoted to cheese from the United States.

A room about twenty-six feet square was partitioned off from either end of the main structure,—that on the south end for fancy and foreign cheese, and the one on the north end for butter. The centre of the building between these two rooms was occupied with two apartments for the display of dairy apparatus. The butter and cheese display-rooms were all fitted with appropriate shelving, and the room for butter was supplied with the necessary means of refrigeration. Against my protest, and, as it proved in the end, much to the detriment of the display of cheese, this necessary precaution against extreme heat was left out of the rooms in which factory cheese was to be shown. Though no positive injury necessarily resulted to the cheese placed in them from this omission, yet in the hottest part of the summer the temperature in these rooms could not, without refrigeration, be prevented from becoming too high to allow of keeping cheese in them for more than a short time without hurrying it to premature ripeness, and consequently to a depreciation of value.

The danger and cost of transporting cheese in small quantities over long distances by rail, and of carting it to and from the Dairy Building, were too great for dairymen to afford to make the frequent relays of cheese necessary to keep up a continual show. The defect in refrigeration worked a double disadvantage. It caused discouragement of exhibits, and the result was that the cheese display-room for the United States was nearly empty during the months of July and August. The display of butter met with a similar misfortune. At the opening of the special display of dairy-products in the last days of June, the authorities having immediate charge of this department omitted to make a requisition for ice till the moment it was wanted. The extremely hot weather which occurred just at that time so

increased the consumption of ice that the Supply Department failed to meet the full demands of the enlarged orders, and the butter-room had to wait its turn, and some eight or ten days elapsed before the requisition for ice for its use was responded to. The consequence was that the butter had to be exhibited and tested while in an unfavorable condition, and hurried out of the building to prevent further injury. The uncertainty of proper care for their goods, and the danger of transporting them in hot weather, so discouraged exhibitors that no more butter was shown till cool weather in the fall.

In other respects the model factory was well built,—better, indeed, than most of the factories through the country in which cheese is kept in hot weather. It was two stories high, neatly clapboarded and painted outside and lathed and plastered inside, with casings painted and floors laid with matched boards. The walls and partitions inclosing the display-rooms were so liberally glazed as to give an almost unobstructed view of the goods on exhibition without exposing them to the interference of visitors or contamination from the outside air. A hall, eight feet wide, on the west side protected visitors from the weather and the rooms within from the heat of the sun. For all other sides there was a similar protection by verandas. A part of the upper story was occupied with rooms for officers and committees, a part with a cheap lunch-room for dairymen and others, which proved to be a needed and valuable auxiliary to the department, leaving about one-third of the upper part without any special use.

This building was designed to contain all the dairy-products which should be offered for exhibition; but it did not receive them all. It was not ready for use till about the middle of June, when most of the foreign exhibits had arrived and found the best place they could in Agricultural Hall or elsewhere, and were not afterwards moved to the Dairy Building.

The display of products connected with the Dairy, which were submitted to the Judges of Group IV. for examination, comprised butter, cheese, condensed and preserved milk, butter- and cheese-coloring, preserved rennets, and rennet extracts.

Of butter there was shown a total of 291 packages, having a total weight of 9150 pounds. Of this there were from the United States 226 packages, weighing 7051 pounds; from Canada 23 packages, weighing 1749 pounds; and from other countries 42 packages, estimated at 350 pounds.

This amount was presented in 149 exhibits, of which 123 were from the United States, 16 from Canada, and 10 from other countries, in-

cluding Portugal, the Argentine Republic, Brazil, Netherlands, Germany, Italy, and Denmark.

Butter was furnished by the different States as follows: New York, 48 exhibits; Iowa, 29; Wisconsin, 18; Pennsylvania, 16; Illinois, 7; Ohio, 2; Vermont, 2; Massachusetts, 1.

There were 31 awards for exhibitions of butter recommended by the Committee with which I was connected: 22 for the United States 5 for Canada, and 1 each for Portugal, Netherlands, Germany, and Denmark. Awards in the several States were distributed as follows: In New York, Wisconsin, and Illinois, 5 each; in Pennsylvania and Iowa, 3 each; in Massachusetts, 1.

The display of cheese was much larger than that of butter. From the statistics at my command it appears that there were exhibited at the Dairy Building and on the grounds 2086 packages of cheese, weighing over 55½ tons. These were presented in 407 exhibits. There were from the United States 1018 packages, weighing over 26 tons; from Canada 1003 packages, weighing 29 tons; and from other countries 65 packages, estimated at 500 pounds. These were from Portugal, the Argentine Republic, the Netherlands, Brazil, Victoria, Italy, Norway, Turkey, France, and England.

Cheese was offered from the different States as follows: From New York, 627 boxes; Wisconsin, 284; Pennsylvania, 55; Ohio, 48; and Connecticut, 4.

The cheese from foreign countries were generally of small size. They embraced samples of Stilton, Roquefort, Edam, and small cheeses from the milk of goats and ewes. Some of these were made as far back as 1872, and were still in an excellent state of preservation, and were rich, clean flavored, and palatable. Samples from Portugal were presented made in all the years from 1872 to 1875, inclusive, some of which were very fine and well preserved, and others much out of flavor.

Cheese from the United States and Canada were mostly the products of factories. Few of dairy make were presented from either country.

Over 100 awards were recommended for exhibits of cheese. Of these, 45 were for exhibits from the United States, and were distributed among the States in the following order: New York 21, Wisconsin 20, Pennsylvania 3, and Ohio 1. The recommendations for Canada were 49, and the remainder were for other foreign countries.

In the usual course pursued by judges at county and State fairs, of "lumping" at the merit of samples of dairy goods without any analysis or precise record of qualities, and carrying the degree of merit in the mind of the inspector from one to another through a long series

of samples, confusion and difficulty have often occurred, and the effort to secure even an approximation to accuracy has been a tedious work, especially where the goods were to be classified into several grades. The anticipation of a similar difficulty at Philadelphia having been several times expressed, and the query often raised as to how the Judges could, with any sort of accuracy, distinguish between the large number of samples, so very nearly alike, not only in appearance but in actual merit, as were these presented to the International Judges for examination, a brief statement of the mode of judging adopted, by which all confusion and inaccuracy were avoided and the labor greatly facilitated, seems appropriate.

At the suggestion of the Chief of the Agricultural Bureau a scale of points was prepared for both butter and cheese, to be rated by numbers, the sum of whose numerical values should, in each case, be 100 when the samples were in all respects perfect. These scales were each divided into six points, and a value given to each point according to its importance in making up a perfect sample. To make it easy for the Judges, the points were arranged in order, and a definition or description of the items which were most prominent in making up the positive qualities in each point was placed against it, and directly opposite this was a definition of the chief negative qualities which enter into defective samples.

Strictly speaking, two points cover all there is to either butter or cheese. One of these depends upon the peculiarities derived from the milk used, the other depends on manufacture. But for greater distinctness and ease in estimating, the most prominent and clearly-recognized results derived from manufacturing were divided into different points. The scales of points, with their positive and negative definitions, were as below :

SCALE OF POINTS FOR JUDGING BUTTER ON A BASIS OF A TOTAL  
OF 100 AS PERFECTION.

Definition of Positive Qualities.

*Flavor 25.*—Agreeable, clean, nutty, aromatic, sweet, pure, distinct, and full.

*Keeping Quality 20.*—Inclined to slow changing, indicative of stability in retaining good qualities.

*Solidity 10.*—Stiffness of body, firmness, not easily melting or becoming soft.

*Texture 15.*—Compactness, closeness of grain, breaking with a distinct fracture like cast-iron, fat-globules unbroken and perfect, sticking little to trier.

Definition of Negative Qualities.

Strong, rancid, tallowy, cheesy, bitter, stale, insipid, too salt, too fresh.

Early loss of good qualities and assumption of bad ones, indicating rapid change.

Softness of body, unable to stand firm, easily melting or becoming soft.

Openness of grain, salvy, greasy, sticking to trier or knife in cutting, pasty, not breaking with distinct fracture.

**Definition of Positive Qualities.**

*Color 15.*—Pleasing, natural, not appearing artificial, bright, even.

*Make 15.*—Includes all not included under other points, as cleanliness, perfect separation of buttermilk, proper handling of milk and butter, as churning, working, salting, skillful packing, etc.

**Definition of Negative Qualities.**

Excessively deep or pale, appearing artificial, dull, uneven.

Uncleanliness, imperfect churning, or at bad temperature, uneven working, salting, bad or messy handling, packing or moulding, etc.

**SCALE OF POINTS FOR JUDGING CHEESE ON A BASIS OF A TOTAL OF 100 AS PERFECTION.**

**Definition of Positive Qualities.**

*Flavor 25.*—Agreeable, nutty, buttery, fine and full.

*Keeping 15.*—Preservation, inclination to slow changing, retention of good qualities.

*Quality 20.*—Mellow, salvy, pasty, flaky, stocky, rich, soluble, melting on the tongue.

*Texture 15.*—Solid, close, firm, compact.

*Color 10.*—Pleasing, natural; not appearing artificial, even.

*Make 15.*—Includes all not included under other points, as use of rennet, proper manipulation, ripening curd, salting, pressing, curing, perfect rind, cleanliness, etc.

**Definition of Negative Qualities.**

Off flavor, strong, tainted, sour, bitter, rancid, rapid.

Rapid decay, early loss of good qualities; soon taking on bad ones, inclined to rapid changing.

Tough, leathery, curdy, sticky, dry, crumbly, insoluble, not melting on the tongue.

Porous, spongy, loose, weak.

Excessively deep or pale, unnatural, uneven.

Improper use of rennet, uneven heating, handling, and ripening curd, bad salting, bad curing, imperfect rind, cracks, skippers, uncleanliness, etc.

In accordance with a scale prepared as below, the Judges could place opposite the points respectively such numbers as, in their judgment, indicated the merits of the particular exhibit under examination. I copy from my note-book a few analyses of butter for illustration :

PERFECTION.	No. in Catalogue . . . 24				20				33				17			
	No. Examined . . . 1st.				2d.				3d.				4th.			
25	Flavor . . . .	21	25	23	17											
20	Keeping . . . .	17	20	19	18											
10	Solidity . . . .	8	9	8	8											
15	Texture . . . .	14	14	13	11											
15	Color . . . .	15	15	13	13											
15	Make . . . .	14	15	14	13											
100	Totals . . . .	89	98	90	80											

A comparison of results shows at a glance the per cent. of perfection and comparative merit of each sample, according to the judgment of the examiner. But it was not found necessary to go through this formality with every sample. After a little experience the operator was able to estimate the per cent. of perfection with much accuracy, and to set it down at once. This was done with a short description

of the exhibit following the Catalogue number. Thus, in the examination of butter:

"No. 275. 1 firkin, June make, fine, nutty flavor, well preserved, pretty salt, bottom slightly changed from contact with wood . 90

"No. 314. Three 55-pound pails; best yet seen . . . 100."

These descriptions and numbers, following the Catalogue numbers, enabled the Judges to see exactly, upon looking over their minutes, just what opinion they had formed from the examination of each exhibit, and saved them the necessity of carrying qualities in their minds. Where very close discriminations were required, as in United States butter and Canadian cheese, where special prizes were to be awarded, the packages rated the highest—those which would stand any chance in the competition—were re-examined next day, in the morning, while we were fresh and our tastes in the best condition. In this way any error or misjudgment which might occur from fatigue or confusion of taste would be readily corrected. But it was very rare that the record of our first examinations required to be changed by a second one.

The exhibits were known only by their numbers, and ownership and place of derivation were kept out of sight as far as possible, the Judges desiring to follow absolutely nothing but quality of exhibits in making their discriminations. From first to last they have constantly aimed at fairness and accuracy. If they have made mistakes, they have done nothing more than those who have preceded them in such labors; but they console themselves with the consciousness that they have endeavored to do right, and flatter themselves that in no department of the International Exhibition have awards been more carefully or justly made than in the department of the Dairy.

The few samples of condensed and preserved milk were examined with much interest, as they afforded an evidence of the triumph of science and art in successfully counteracting the very perishable tendency of milk in its natural condition, and giving it, both as a luxury and a necessity, a broader use in the food of nations. The specimens shown were of various ages, but all well preserved, sweet, palatable, and in every way suitable for use, the natural properties of the milk being unchanged.

According to a paper by Professor E. N. Horsford, of Cambridge, Massachusetts, read at the recent meeting of the American Dairy-men's Association, in Judges' Hall, and which will appear in the twelfth annual report of that Association, it is just a half-century since the efforts at condensing and preserving milk, in the mode now in use, began. The following salient points in the history of condensed

milk are gathered from the paper referred to. The work commenced with A. A. Malbec, of Paris, in 1826, who condensed milk with a water-bath, using sugar to preserve it. Four years later Braconnet preserved the casein of milk after separating it from the whey, and prepared it for use in a liquid form as a substitute for milk. In 1835, William Newton patented a process, in England, for the condensation of milk in vacuo, and preserving it by the addition of sugar. He also patented a method of condensing milk by passing currents of air rapidly over it. He was not very successful by either method, as is evident from the variety of patents which followed. As late as 1847 a patent was issued in France for condensing milk in open, shallow vessels in a water- or steam-bath, with constant stirring and the addition of sugar. In none of these processes was the proportion of sugar definite, nor the temperature reduced very far below boiling.

In 1849, Professor Horsford, of Massachusetts, determined, in his laboratory, the precise proportion of sugar necessary to perfect preservation and the necessity of condensing at a lower temperature than had been previously used. He turned over his advance to his assistant (Mr. Dalson), who took out a patent in the United States for further improvements in 1854. Dalson gave to preserved milk some character for commercial importance. In connection with the Messrs. Blatchford & Co., of New York, he, in 1856, prepared six hundred pounds of dry solid milk for the use of Dr. Kane in his Arctic exploring expedition, which sailed in that year, and during which it proved of great value in preserving the health of the crew. A sample of this dry solid furnished for Dr. Kane, preserved by loosely wrapping in paper, was shown to the Judges and at the meeting of the American Dairyman's Association, and, although twenty years old, was sound and sweet.

To Gail Borden, of New York, was issued a patent, in 1856, for the condensation of milk in vacuo without the addition of sugar, which was sold for immediate use. Afterwards he added sugar, and preserved the condensed milk for long keeping by sealing it in air-tight boxes of tin. Although all that was essential to success had been patented before him, Mr. Borden evidently made a much better use of the developments which had been made than any of his predecessors, as he was the first to make a commercial success of the condensation and preservation of milk. No important advance has been made since the time of Borden, the modes he adopted being now in general use both in America and Europe.

One more advance in this art is much needed to give it greater

utility. I allude to the necessity of some mode by which milk can be condensed in smaller quantities without increasing the cost. In view of the great value of milk as human food, its perfect nutritive qualities, its wholesome effects, its agreeable flavor, and the low cost and great extent to which it can be produced, any means which would aid in giving it a more extended use must prove of great value not only to dairymen, but to the general public. But with the present means of condensing, preserved milk now forms an important item in the dairy interest on either continent.

Some fine samples of cheese-coloring were exhibited, but nothing important in this line was developed. The same may be said of preserved rennets. In butter-coloring a comparatively new product was presented from Copenhagen, Denmark. It consisted of extract of annotta, prepared in oil, thus avoiding the use of an alkaline solvent in the preparation of the coloring matter, an agent which is regarded as injuring the texture and keeping of butter.

There was also shown from the same place an improved extract of rennet, free from flavor or odor, of greatly concentrated and uniform strength. These are regarded as valuable improvements in the art of dairying, and it is gratifying to know that both preparations are now coming into use in the United States.

The annual production of butter in the United States is now estimated to be about 710,000,000 pounds, of which the fraction exhibited at Philadelphia is but a hundred-thousandth part. Yet, small as it is, it appears, by reference to the catalogues, that it is larger in proportion to the amount produced than the exhibits of any other agricultural product from our own country, unless perhaps we except tobacco. Since the per cent. exhibited is in excess of other agricultural products shown by the United States, the show even of butter, which was in much smaller quantity than of cheese, cannot, so far as quantity is concerned, be regarded as a failure.

The quality of butter shown has given a good indication of the progress which is being made in its manufacture, and has afforded some valuable lessons. I will only allude to one or two. With the exception of Canada, the butter from foreign countries came to us from long distances. It was necessarily made a long time in advance of its exhibition and test by the Judges. The greater part of it was unsalted, and to such as received salt at all it was applied very sparingly, yet some of these samples were in a fine state of preservation and not at all rancid.

One of the samples from Denmark had been exhibited at the Vienna Exposition in 1873, and was still sweet and little changed,



while packages of recent make from our own country, and highly salted to preserve them, were hurrying to destruction in a few short weeks. The long keeping of the fresh butter seems to prove that salt does not preserve it, but that the keeping quality depends more upon making than salting.

A large share of the butter of the United States which finds its way to the large markets is now made in factories and creameries. The products of these establishments—while they have always afforded to the dealer the advantages of large quantities and evenness of quality, for which he could afford to pay a premium over dairy-made butter, never uniform and always expensive to collect—have all along been regarded, and justly, as inferior both in flavor and keeping to the best dairy make. At both the June and October displays the most perfect flavor and longest-keeping quality were found in the butter of factory make. The samples of butter presented have thus evidenced an important advance in this branch of the dairy interest.

I may mention the butter from the factories of Messrs. John Stewart & Co., of Manchester, Iowa, as a model product of this kind. Considering the large amount exhibited,—sixty-four packages made at different times at seven different factories, and every package excellent,—they deserve great credit for the superior quality of the goods they exhibited. Nine packages of similar excellence, the product of two creameries, were shown by Messrs. Gooch & Barber, of Chicago, Illinois.

The peculiarities of factory cheese were well delineated in the exhibits both of the United States and Canada. In the June display there appeared samples of fine cheese made from the milk of cows, some fed on hay and others on grass, demonstrating that it is possible, even under what are usually considered adverse circumstances, to produce goods of high quality. The great bulk of the "hay cheese," as it is called, was not particularly fine. That shown in August and September was much off flavor, the milk of which it was made having been affected by excessive heat. Not more than twenty-five per cent. of these exhibits were strictly fine, but that small fraction proved the possibility of making first-class cheese all the season, if first-class skill were employed in producing and manipulating the milk.

The cheese exhibits from both countries in the October display were generally fine, and attested the superior excellence to which the factory system is capable of reaching. Finer samples of cheese I have nowhere met with than appeared among them, some being absolutely faultless. The very choicest—those which had the highest,

purest, and most nutty flavor, and which appeared the richest and most meaty—had alike the same peculiarity of having the curd removed from the whey at the earliest period in the process of manufacture. This is the essential feature in what is known as the "Cheddar process" of cheese-making. The difference in quality between samples of cheese made by the two processes of early and late removal of the curd from the whey, as they have appeared through the entire show, has been so great as to leave no doubt in the mind of the observer that the former is the safest way to secure superior goods, especially when the milk is at all varied from its perfectly normal condition. Foreign ferments—those which do not properly belong to perfect milk—are quite liable to appear in it from one cause or another in hot weather. These develop with great rapidity in the warm whey, and react upon the curd lying in it. The early separation of curd and whey prevents this, and makes high quality possible where otherwise it would not be.

The factory cheese shown by the United States was not very uniform in quality, some of it being of great excellence, and some quite ordinary. Cheese of the highest order was confined to no particular locality, though New York State took the lead in the proportion of such cheese exhibited. Among the best cheese from the States were samples from the factory of Dr. L. L. Wight, Whitesboro', Oneida County, New York; Hon. E. C. Rice, Fairfield, Herkimer County, New York; G. W. Davis, Little Falls, Herkimer County, New York; M. N. Seward, Lake Mills, Jefferson County, Wisconsin; and J. G. Holman, Conneautville, Crawford County, Pennsylvania, all of which were of great excellence, and were graded alike at 95 per cent. of perfection. The best sample from the States was shown by C. W. Richardson, of Herkimer, Herkimer County, New York, and was graded at 96 per cent. of perfection. The cheese from the United States averaged in the October display 76.82 per cent. of perfection.

The factory cheese from Canada was also quite uneven, the extremes being wider even than in those from the United States, though the average was higher. The average of the October exhibits from Canada was 87.36. The cheese presented in October by the Hon. Thomas Ballantyne, M.P., of Stratford, Ontario, in which the "Cheddar process" was most successfully carried out, was the finest shown during the exhibition, and was marked perfect. To it was awarded the sweepstake prize offered by the Canadian Government for the best cheese from that country. Samples shown by Alexander McKenzie, of Kastnerville, Ontario, and David Chalmers, of Ingersoll,

Ontario, were of extraordinary merit, and in such close competition as to be graded at 100.

The cheese-product of the United States and Canada has assumed great prominence as an article of foreign commerce, about one hundred millions of pounds being annually exported from the former, and nearly half as much more from the latter country. This prominence has grown out of improvements in manufacture introduced through the associated system of dairying which originated in the United States. The advantage of this new system in the manufacture of cheese and butter (for butter is made by this system as well as cheese) is that the parties engaged in it become mutual instructors; first, by an examination of each other's work, the manufactories being in a measure public, and open for inspection; second, by organizations for a mutual giving and reception of information relating to their art. The producers, manufacturers, and dealers form themselves into associations for the discussion and investigation of topics relating to their respective branches of the industry, and develop knowledge by which milk is more profitably produced, goods more skillfully and cheaply manufactured, and more systematically and successfully handled in marketing.

The value of this new system is shown by the rapidity with which it has spread. In the United States it has nearly superseded the manufacture of cheese in families; and dairy associations, which are a constant accompaniment of factories, have assumed great importance, and become a prominent feature in this system of dairying. Thus we have the American Dairymen's Association, representing the United States and Canada; the Northwestern Dairymen's Association, embracing several States; and the National Butter and Egg Association, with its eight hundred members, covering an equal area. The States of Maine, Massachusetts, Vermont, New York, Pennsylvania, Ohio, Illinois, Wisconsin, Iowa, and California each have an association representing the State, and many of them smaller organizations representing counties and towns. Two of these larger organizations, the American Dairymen's Association and the National Butter and Egg Association, held meetings on the Centennial grounds in October.

The proximity of Canada to the United States led to the introduction of the American system into that country as soon as it had made any considerable progress here, and its introduction has been followed by the establishment of a flourishing institution known as the Dairymen's Association of Ontario.

Within the past few years this system has been gaining a successful

foothold on the east side of the Atlantic, and as a result of this extension we have had the gratification of learning since the beginning of this Exhibition that a British Dairy Farmers' Association has been formed, representing the dairy farmers of the British Isles, and, with an able corps of officers, is going at once into efficient operation, thus carrying out not only the American system of dairying in Great Britain, but the further American practice of connecting dairy associations with the adoption of cheese- and butter-making in factories.



# REPORTS ON AWARDS.

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## GROUP IV.

### 1. Andrew Erkenbrecher, Cincinnati, Ohio, U. S.

#### STARCH.

*Report.*—The exhibit is fine; the starch white and very firm, and of great purity and strength, and stability.

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### 2. Wm. Barnett, Philadelphia, Pa., U. S.

#### STARCH.

*Report.*—The product is the best on exhibition, made from wheat; is very white and pure, of good appearance and strength, and free from acidity.

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### 3. T. Kingsford & Son, Oswego, N. Y., U. S.

#### STARCH.

*Report.*—They make a very fine exhibit of starch, put up in various forms and for different uses; their starch shows great purity and strength, and is free from acidity.

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### 4. George Fox, Cincinnati, Ohio, U. S.

#### STARCH.

*Report.*—The product is very white and pure, and free from acidity.

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### 5. Duryea's Glen Cove Starch Co., Glen Cove, Long Island, N. Y., U. S.

#### STARCH.

*Report.*—They make a very large and varied exhibit of starch, of very fine appearance. Their product is of notable purity and whiteness, and consequent strength and freedom from acidity.

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### 6. J. J. Wood & Co., Columbus, Ohio, U. S.

#### STARCH.

*Report.*—The starch is of fine appearance; very white and pure, and free from acidity.

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### 7. Edwardsburg Starch Co., Edwardsburg, Quebec, Canada.

#### STARCH.

*Report.*—A product very white, sweet, pure, and strong.

**8. Catelli Brothers, Montreal, Canada.**

## FARINA AND POTATO STARCH.

- Report.*—1. A very good quality of farina, made with the hardest wheat grown in Canada  
 2. A very good quality of potato starch.
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**9. Mirat & Son, Salamanca, Spain.**

## STARCH.

*Report.*—Good white starch, of rice.

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**10. Antonio Tato & Co., Salamanca, Spain.**

## STARCH.

*Report.*—Very good starch, of rice; of good color.

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**11. Carnero & Colsa, Salamanca, Spain.**

## STARCH.

*Report.*—Good white starch, of rice.

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**12. José Maria Citove, Alicante, Spain.**

## STARCH.

*Report.*—Good white starch, of rice.

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**13. Colony Itajahy, Santa Catharina, Brazil.**

## MANDIOL STARCH AND FLOUR.

*Report.*—Products well prepared, and of good quality.

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**14. Dr. H. Rodrigues d'Alvarenga, Rio de Janeiro, Brazil.**

## STARCH, FLOUR, AND PASTE OF MANDIOL, TAPIOCA.

*Report.*—The products are well prepared; rich in starch, and of excellent taste; price moderate.

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**15. Imperial Institute of Agriculture, Rio de Janeiro, Brazil.**

## MANDIOL STARCH AND SAGO, OF TWO KINDS.

*Report.*—The articles are of fine quality and excellent preparation.

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**16. J. F. do Rego, Pernambuco, Brazil.**

## ARROWROOT STARCH.

*Report.*—The product is of the finest quality, and at low prices.

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**17. M. G. Assumpção, Paraná, Brazil.**

## MAIZE STARCH.

*Report.*—The article is good, well prepared, and cheap.

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**18. A. L. S. Ribas, Paraná, Brazil.**

## STARCH OF ARROWROOT.

*Report.*—The product is well prepared, and of good quality.

## 19. Colony Dona Francisca, Santa Catharina, Brazil.

## MANDIOC STARCH AND FLOUR.

*Report.*—Preparations excellently well made.

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## 20. Colony Blumenau, Santa Catharina, Brazil.

## MANDIOC STARCH AND SIMILAR PRODUCTS.

*Report.*—Articles of good quality and well prepared.

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## 21. M. F. A. Jorge, Alagoas, Brazil.

## STARCH OF ARROWROOT.

*Report.*—The product is of good quality and preparation.

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## 22. S. A. Vieira, Maranhão, Brazil.

## GRANULAR TAPIOCA.

*Report.*—The article is well prepared and of good quality; price reasonable.

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## 23. José C. Furtado, Pará, Brazil.

## GRANULAR TAPIOCA.

*Report.*—The product is of good appearance and taste, and moderate prices.

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## 24. D. M. J. C. Silva &amp; Sons, Rio de Janeiro, Brazil.

## PEARL TAPIOCA.

*Report.*—The article is of the highest excellence in appearance and quality.

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## 25. Baron of Pirapting, Rio de Janeiro, Brazil.

## PREPARATION OF TAPIOCA.

*Report.*—The product is well prepared and of good quality.

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## 26. Baron of Villa Franca, Rio de Janeiro, Brazil.

## MANDIOC, TAPIOCA, FLOUR, AND STARCH.

*Report.*—The above-named products are of excellent quality.

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## 27. M. A. Guimarães, Paraná, Brazil.

## MANDIOC FLOUR.

*Report.*—Articles of good quality and well prepared.

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## 28. Agricultural Commission of Paraná, Paraná, Brazil.

## PREPARED CORN, SIX SAMPLES.

*Report.*—A new product,—prepared corn.

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## 29. Veenhoven, Schuringa, &amp; Co., Wildervank, Netherlands.

## POTATO STARCH.

*Report.*—A very fine product, without color and taste.



30. J. Duijvis, Koog-on-the-Zaan, Netherlands.

STARCH.

*Report.*—Commended for the following reasons:

1. A very good preparation of Urlings' patent starch.
2. Well crystallized; clear, white color; scentless.

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31. W. Marks, Tweed River, Queensland, Australia.

ARROWROOT.

*Report.*—A product very white and pure, of excellent clearness and strength.

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32. Henry Lane, North Pine, Queensland, Australia.

ARROWROOT.

*Report.*—A product pure, strong, and sweet.

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33. W. Cole & Son, New South Wales, Australia.

ARROWROOT.

*Report.*—A product very white, pure, strong, and clear.

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34. A. T. Lawrie, Gloucester, New South Wales, Australia.

ARROWROOT.

*Report.*—A product pure, white, and strong.

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35. James Waters, Brisbane Water, New South Wales, Australia

ARROWROOT.

*Report.*—White, fine, and sweet.

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36. T. F. Tucher, Hamilton, Bermuda.

ARROWROOT.

*Report.*—A product of snowy whiteness, and every way excellent.

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37. Andrés Naves, Pampanga, Philippine Islands.

ARROWROOT.

*Report.*—A good preparation; white and fine

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38. Benigno de Ocampo, Pampanga, Philippine Islands.

ARROWROOT.

*Report.*—Excellent preparation; white and soluble.

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39. Lucia Rodriguez, Pampanga, Philippine Islands.

ARROWROOT.

*Report.*—A fine preparation; very white.

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40. Catalino Lorenzo, Pampanga, Philippine Islands.

ARROWROOT.

*Report.*—A good preparation; very white and fine.

## 41. Cesare Bonacina, Milan, Italy.

## ARROWROOT AND OAT FARINA.

*Report.*—Arrowroot, a very good preparation; oat farina, very well prepared. Both recommended for children.

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## 42. Weld &amp; Hill, Medina, Orleans Co., N. Y., U. S.

## FARINA.

*Report.*—A good farina, well ground, well prepared from hard American wheat. It is a combination of winter and spring wheats.

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## 43. Catherine Taldykin, Eletz, Orel, Russia.

## FARINA.

*Report.*—Two sorts of farina of a very good quality.

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## 44. Marge Son, Lyons, France.

## MACARONI, VERMICELLI, AND PASTES AND FARINA.

*Report.*—A splendid collection of pastes made with the Taganrog and Russian wheat, good preparation, excellent in quality, and cheap; farina of various sizes from hard Russian and African wheat of superior quality.

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## 45. Rodrigo Arqueaga, Burgos, Spain.

## FARINA (SEMOLA).

*Report.*—Farina of a good quality.

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## 46. José Segura, Seville, Spain.

## FARINA (SEMOLA).

*Report.*—Three kinds of farina, very well prepared.

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## 47. Bougleux Brothers &amp; Co., Leghorn, Italy.

## FARINA (SEMOLA).

*Report.*—Farina ground from Russian wheat, well prepared and of very superior quality.

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## 48. August Aly, Hamburg, Germany.

## FARINA.

*Report.*—Of good quality and in very good condition.

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## 49. Lagomarsino &amp; Cuneo, Philadelphia, Pa., U. S.

## MACARONI, VERMICELLI, AND FANCY PASTES.

*Report.*—Commended for manufacturing macaroni, vermicelli, and nearly one hundred different fancy pastes, white and yellow; for excellence, fine appearance, and cheap prices. Messrs. Lagomarsino & Cuneo manufacture their pastes with the best farina, which is of their own manufacture; also farina of good quality, taken from hard wheat grown in America and very carefully prepared.

## 50. Catelli Brothers, Montreal, Canada.

MACARONIS, SOUP PASTES, ETC.

*Report.*—Commended for fine appearance, firmness of paste, good material, and color.

## 51. R. Spinelli, Montreal, Canada.

FANCY SOUP PASTES, WHITE AND YELLOW.

*Report.*—Commended for the following reasons:

1. Fine appearance and color.
2. Firmness.
3. Made with good farina.
4. Great variety.

## 52. Dandicolle Son &amp; Gaudin, Bordeaux, France.

MACARONI AND PASTINES.

*Report.*—Macaroni and vermicelli; very cheap; good preparation.

## 53. Louit Brothers &amp; Co., Bordeaux, France.

FRUIT PRESERVED IN SYRUPS; MUSTARD, CAPERS, AND OLIVES.

*Report.*—The fruit is of delicate flavor, fresh, and of fine appearance, and the syrup of excellent quality; the mustard is of excellent quality and remarkably cheap; the capers, gooseberries, and olive farcies are of very good taste, fresh, and carefully put up.

## 54. Louit Brothers &amp; Co., Bordeaux, France.

MACARONI AND PASTES; LIQUORS AND CHOCOLATE.

*Report.*—The pastes are good, very well prepared, and cheap; liquors very nice—that called Saint-Emilor—and distilled with great care; the chocolate of high standard and very fine preparation.

## 55. Martinez Sainz Brothers, Seville, Spain.

MACARONI AND OTHER PASTES.

*Report.*—Commended for cheapness and good quality.

## 56. José Ponseti y Gomila, Mahon, Balearic Islands.

SOUP PASTES.

*Report.*—Commended for good quality and price adapted to the poorer classes.

## 57. Francisco Carmillo, Lisbon, Portugal.

PASTES.

*Report.*—A fine assortment of pastes; very finely prepared and in excellent condition; made wholly from the finest qualities of farina and other flours.

## 58. Alves &amp; Brother, Lisbon, Portugal.

PASTES.

*Report.*—A collection of fine and delicate white and yellow pastes; well prepared and in very good order; very cheap, and especially adapted to home consumers.

59. **Chaves & Brother, Lisbon, Portugal.**

## PASTES.

*Report.*—A variety of Italian pastes, made purely of farina and other flours; very well prepared and well conditioned.

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60. **Silva, Leal, & Santos, Rio de Janeiro, Brazil.**

## MACARONI AND SOUP PASTES.

*Report.*—Commended for the following reasons:

1. Well manufactured by steam power.
  2. Made of the finest farina.
  3. Good taste and variety.
  4. Excellent imitation of all kinds of Italian pastes.
- 

61. **Sebastiano Ferrari, Orvieto, Italy.**

## MACARONI AND OTHER PASTES.

*Report.*—Commended for cheapness and good quality.

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62. **Eduardo Frosini & Brothers, Ponsacco, Pisa, Italy.**

## MACARONI AND OTHER PASTES.

*Report.*—Of the very finest quality; very white; of beautiful taste and fine flavor, and in great variety.

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63. **Special Committee of Salerno, Italy.**

## MACARONI AND OTHER PASTES.

*Report.*—A variety of cheap wholesome pastes, used mostly by the poorest classes.

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64. **Bougleux Brothers & Co., Leghorn, Italy.**

## MACARONI AND OTHER PASTES.

*Report.*—Commended for durability, good preservation, and comparative cheapness.

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65. **Duke of Palazzo, Catania, Italy.**

## MACARONI AND OTHER PASTE.

*Report.*—Good and cheap paste for common people and sailors.

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66. **Joseph Andronico, Mizza, near Messina, Italy.**

## MACARONI AND OTHER PASTES.

*Report.*—A variety of good and cheap pastes.

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67. **Raffael de Simone, Torre, Annunziata, Italy.**

## MACARONI AND OTHER PASTES.

*Report.*—Of the very finest quality; very white; good taste and fine flavor, and in great variety.

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68. **G. B. Castino & E. Scotta, Turin, Italy**

## MACARONI AND OTHER PASTES.

*Report.*—A fine quality of paste, put up in various-sized boxes; good quality for soup.

## 69. Ferdinand Gentili &amp; Sons, Pontosserchio, Pisa, Italy.

## MACARONI AND OTHER ITALIAN PASTES.

*Report.*—Commended for prime quality of macaroni and other pastes, whiteness, exemption from insects, and good preservation.

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## 70. Biagio Russo, Termini, Palermo, Italy.

## MACARONI AND OTHER PASTE.

*Report.*—A great variety of small and superior paste; white and colored with extract of saffron.

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## 71. J. F. Röper, Neuwied-on-the-Rhine, Germany.

## PASTES.

*Report.*—An assortment of Italian pastes of good quality and excellent preparation.

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## 72. Luigi Chiozza, Cervignano, near Trieste, Austria.

## PASTINES.

*Report.*—These pastines, made of farina the twenty-fifth part extracted from Indian corn, are very well manufactured.

It is a new article in the market.

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## 73. C. &amp; J. Mattmann, Horw, Luzern, Switzerland.

## ALIMENTARY PASTES.

*Report.*—Very good pastes, made out of fine farina, and in very good condition.

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## 74. C. J. Fell &amp; Brother, Philadelphia, Pa., U. S.

## SELF-RAISING FLOUR.

*Report.*—Commended for—1. The economy of time and flour in its use.  
2. The healthfulness of the compound formed by the chemical combination.

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## 75. E. V. Machette, Philadelphia, Pa., U. S.

## SELF-RAISING FLOUR.

*Report.*—Commended for the following reasons:

1. It affords a great convenience for making bread, cakes, pastry, etc., without the inconvenience and uncertainty attending the process of fermentation.
  2. A saving in the amount of flour to a given quantity of bread.
- 

## 76. Oswego Milling Co., Oswego, N. Y., U. S.

## GRAHAM FLOUR.

*Report.*—Color fine; well manufactured.

---

## 77. Ferdinand Schumacher, Akron, Ohio, U. S.

## FLOUR FROM WINTER WHEAT.

*Report.*—Color fine, strength fair; adapted for general consumption; without any special qualities.

## 78. George C. Thilenius, Cape Girardeau, Mo., U. S.

## FLOUR FROM WINTER WHEAT.

*Report.*—Color good, strength fair; adapted for general consumption.

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## 79. Weld &amp; Hill, Medina, Orleans County, N. Y., U. S.

## FLOUR.

*Report.*—Color very fine, strength fair; a family flour, but not of the highest grade. Quality of wheat uncertain, method of grinding unknown.

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## 80. C. A. Gambrill &amp; Co., Baltimore, Md., U. S.

## FLOUR FROM WINTER WHEAT.

*Report.*—Color good, strength fair; adapted for general consumption.

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## 81. W. P. Ankeny &amp; Brother, Minneapolis, Minn., U. S.

## FLOUR FROM SPRING WHEAT—PATENT PROCESS.

*Report.*—Color fine, strength fair; made from purified middlings; adapted for bread.

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## 82. Porter &amp; Mowbray, Winona, Minn., U. S.

## FLOUR FROM HARD SPRING WHEAT, AND FROM SPRING WHEAT, PATENT PROCESS.

*Report.*—1. Flour from hard spring wheat of fine color, great strength. It is exclusively a baker's flour which combines to advantage with other grades, and is called a "straight."

2. A flour from spring wheat, patent process, of good color, fair strength; made from purified middlings, and adapted for bread.

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## 83. Red Wing Mills, Red Wing, Minn., U. S.

## THREE VARIETIES OF FLOUR.

*Report.*—1. Flour from spring wheat, hard variety; color very fine, strength great; a baker's flour exclusively; combines to advantage with other grades; known as a "Minnesota Straight."

2. Flour from hard wheat; color very good, strength fair; makes good bread, but especially adapted for biscuit and pastry.

3. Flour from spring wheat, patent process; color very good, strength fair; made from purified middlings; adapted for bread.

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## 84. Joseph Pollock, Vincennes, Ind., U. S.

## FLOUR FROM WINTER WHEAT.

*Report.*—Color good, strength fair; adapted for general consumption, without any special qualities.

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## 85. William P. Evans, Paoli, Pa., U. S.

## FLOUR FROM WINTER WHEAT.

*Report.*—Color very good, strength fair; adapted for general consumption, without any special qualities.

## REPORTS ON AWARDS.

## 86. Homer Baldwin, Youngstown, Ohio, U. S.

## FLOUR FROM WINTER WHEAT.

*Report.*—Color very fine, strength great; adapted for bread.

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## 87. A. A. Taylor, Loudonville, Ohio, U. S.

## TWO VARIETIES OF FLOUR FROM WINTER WHEAT.

*Report.*—First is a flour of fine color, fair strength, and adapted for general consumption. Second is a flour of very fine color, fair strength, and makes good bread, but is especially adapted for biscuit and pastry.

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## 88. Oregon City Mills, Oregon City, Oregon, U. S.

## FLOUR FROM WINTER WHEAT.

*Report.*—Color very fine, strength fair; makes good bread, but is especially adapted for biscuit and pastry.

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## 89. Jesse Ames &amp; Sons, Northfield, Minn., U. S.

## FLOUR FROM SPRING WHEAT, PATENT PROCESS.

*Report.*—Color fine, strength great; made from purified middlings; adapted for bread.

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## 90. Jesse Ames &amp; Sons, Northfield, Minn., U. S.

## FLOUR FROM HARD SPRING WHEAT.

*Report.*—Color very fine, strength very great; a baker's flour exclusively; combines to advantage with other grades.

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## 91. J. A. Christian &amp; Co., Minneapolis, Minn., U. S.

## FLOUR FROM HARD SPRING WHEAT, AND FROM PURIFIED MIDDINGS, PATENT PROCESS.

*Report.*—1. Flour from spring wheat, patent process, of very fine color, very great strength; made from purified middlings, and is adapted for bread.

2. Is the same as *first*, except that its color is only *fine*.

3. Flour from hard spring wheat, of fine color, great strength; a baker's flour exclusively, which combines with advantage with other grades, and is known as a "Minnesota Straight."

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## 92. Eisenmayer &amp; Co., St. Louis, Mo., U. S.

## TWO VARIETIES OF FLOUR FROM WINTER WHEAT.

*Report.*—1. Flour of very fine color, fair strength; makes good bread, but is especially adapted for biscuit and pastry.

2. Flour of very fine color, very great strength, and adapted for bread. This is the only flour that came up to the highest standard in both strength and color.

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## 93. George V. Hecker &amp; Co., New York, N. Y., U. S.

## SELF-RAISING FLOUR, SELF-RAISING BUCKWHEAT FLOUR, AND FARINA.

*Report.*—Commended for—1. The convenience and healthfulness of the prepared food-materials exhibited. 2. The light and porous character of the bread made from the flour without the use of yeast.

**94. George V. Hecker & Co., New York, N. Y., U. S.****FLOUR FROM WINTER WHEAT (TWO SAMPLES).***Report.*—No. 1. Color very fine, strength great; adapted for bread.

No. 2. Color very fine, strength fair; especially adapted for biscuit and pastry.

**95. C. A. Pillsbury & Co., Minneapolis, Minn., U. S.****THREE VARIETIES OF FLOUR.***Report.*—1. Flour from spring wheat, patent process. A very fine flour, beautifully milled, of very fine color, very great strength; made from purified middlings, and adapted for bread.

2. Flour from hard spring wheat, known as a "Minnesota Straight." It is of fine color, fair strength; a baker's flour exclusively, which combines to advantage with other grades.

3. Flour of fine color and great strength; it is a family flour, but not of the highest grade made from spring wheat.

**96. Commissioners for Victoria, Australia.****FLOUR FROM WINTER WHEAT.***Report.*—Color good, strength fair; adapted for general consumption, without any special qualities.**97. F. Keats, Allora, Queensland, Australia.****GRAHAM FLOUR.***Report.*—Color very fine; splendidly milled.**98. Neden Brothers, Toowoomba, Queensland, Australia.****FLOUR FROM WINTER WHEAT.***Report.*—Color fine, strength fair; adapted for general consumption, without any special qualities.**99. Watson Brothers, Young, New South Wales, Australia.****FLOUR FROM WINTER WHEAT.***Report.*—Color good, strength good; adapted for general consumption, without any special qualities.**100. Dalton Brothers, Orange, New South Wales, Australia.****FLOUR FROM WINTER WHEAT.***Report.*—Color fine, strength fair; adapted for general consumption, without any special qualities.**101. Lewis Brothers, Tamworth, New South Wales, Australia.****WHEAT FLOUR FROM WINTER WHEAT.***Report.*—Color good, strength fair; adapted for general consumption, without any special qualities.**102. Barry, Arnold, & Co., Cape Town, Cape of Good Hope.****WHEAT FLOUR.***Report.*—Color fine, strength fair; makes good bread, but is especially adapted for biscuit and pastry.



## 103. E. Clear, Cape Town, Cape of Good Hope.

## WHEAT FLOUR.

*Report.*—Color good, strength fair; makes good bread, but is especially adapted for biscuit and pastry.

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## 104. W. Weatherstone &amp; Co., Toronto, Ontario, Canada.

## FLOUR.

*Report.*—Color good, strength fair; a family flour, but not of the highest grade. Quality of wheat uncertain; method of grinding unknown.

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## 105. J. G. King, Port Hope, Toronto, Canada.

## FLOUR.

*Report.*—Flour from winter wheat, of good color, great strength, and adapted for general consumption, without any special qualities.

Flour from winter wheat, of very fine color, fair strength, makes good bread, but especially adapted for biscuit and pastry; also a family flour of very fine color, fair strength; a family flour of fine color and fair strength; a family flour of good color and fair strength; all three from wheat the quality of which is uncertain and the method of grinding unknown.

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## 106. Shirk &amp; Snider, Bridgeport, Ontario, Canada.

## FLOUR FROM WINTER WHEAT.

*Report.*—Color fine, strength fair; adapted for general consumption, without any special qualities.

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## 107. Brodie &amp; Harvey, Montreal, Canada.

## GRAHAM FLOUR.

*Report.*—Color fine; well milled.

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## 108. Brodie &amp; Harvey, Montreal, Canada.

## SELF-RAISING FLOUR.

*Report.*—Commended for the following reasons:

1. It produces a light, porous, and very digestible bread, without the loss attendant on fermentation, which is greater than the additional cost of the self-raising flour.
  2. Should there be a deficiency of phosphates in the diet, the material used in this bread will supply that defect.
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## 109. Starr Mills, Bridgetown, Canada.

## BUCKWHEAT FLOUR.

*Report.*—Commended for fair color and good quality.

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## 110. Lawrence Rose, Georgetown, Canada.

## BUCKWHEAT FLOUR.

*Report.*—Commended for the fair color and sound condition of the product, and its entire freedom from mustiness.

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## 111. Catherina Taldykin, Eletz, Orel, Russia.

## FLOUR.

*Report.*—Color fine, strength great; adapted for general consumption.

## 112. Boudon, Bledat, Algiers.

## FLOUR.

*Report.*—Color very fine, strength fair; makes good bread, but is especially adapted for biscuit and pastry. This flour for color stands in the front rank; is beautifully milled.

## 113. Julian Gordo, Guadalajara, Spain.

## FLOUR FROM WINTER WHEAT.

*Report.*—Color good, strength fair; a family flour, but not of the highest grade; quality of wheat uncertain; method of grinding unknown.

## 114. Marquis de Villa Alcazar, Salamanca, Spain.

## FLOUR.

*Report.*—Color good, strength fair; a family flour, but not of the highest grade; quality of wheat uncertain; method of grinding unknown.

## 115. Manuel Goncalves Cazanova, Beiria, Portugal.

## BARLEY FLOUR.

*Report.*—Well manufactured and of good color; made from good, sound barley.

## 116. Acacio Manoel Pereira &amp; Augusto Risques, Portalegre, Portugal.

## RYE FLOUR.

*Report.*—Very white color; well ground, from excellent grain.

## 117. Antonio Manuel Silva, Bragança, Portugal.

## GRAHAM FLOUR.

*Report.*—Well milled, good color, and of very good, sound wheat. Graham flour made from excellent rye, well milled and of fine color.

## 118. Jose Francisco Serra de Egreja, Oporto, Portugal.

## FLOUR.

*Report.*—Color fair, strength good; adapted for general consumption.

## 119. Antonio Moreira Leão, Oporto, Portugal.

## FLOUR.

*Report.*—Color fine, strength fair; makes good bread, but more especially adapted to pastry.

## 120. Costa &amp; Son, Portalegre, Portugal.

## FLOUR.

*Report.*—Color good, strength great; adapted for bread.

## 121. João de Britto, Lisbon, Portugal.

## FLOUR.

*Report.*—Color very fine, strength fair; makes good bread, but is more especially adapted for biscuit and pastry.

## 122. Steam Bread Bakery of the Mendicity Asylum, Lisbon, Portugal.

FLOUR.

*Report.*—Color fair, strength good; adapted for general consumption.

## 123. Antonio Souza Motta, Vallongo, Portugal.

FLOUR.

*Report.*—Color fine, strength great; makes good bread, but is especially adapted for biscuit and pastry.

## 124. G. Bauer, Santa Fé, Argentine Republic.

FLOUR FROM WINTER WHEAT.

*Report.*—Color good, strength fair; adapted for general consumption.

## 125. Joseph Rosenthal, Vienna, Austria.

SIX VARIETIES OF FLOUR FROM WINTER WHEAT.

*Report.*—Six varieties of flour from winter wheat. The first quality is commended as having fine color and good strength; the second, good color and good strength; the third, fine color and fair strength; the fourth, fine color and great strength; the fifth, good color and fair strength. All five varieties are adapted for general consumption. The sixth variety is commended as having very fine color, great strength, and as being adapted for bread-making.

## 126. Company "The Korenschoof," Utrecht, Netherlands.

WHEAT FLOUR.

*Report.*—Commended as possessing great strength, with absence of moisture; particularly adapted to long sea-voyages.

## 127. N. Verwey &amp; Co., Tiel, Netherlands

POTATO FLOUR, GLUCOSE, AND DEXTRINE.

*Report.*—Commended for good preparation; colorless product. Very fine glucose, of good taste; dextrine very colorless; well prepared.

## 128. G. von Scheele, Kilanda, Goteborg, Sweden.

RYE FLOUR.

*Report.*—Color good; well manufactured.

## 129. The French Steam Flour Mill, Ystad, Sweden.

RYE FLOUR.

*Report.*—Commended for rye flour of very fine color, and of beautiful milling and manufacture.

## 130. French Steam Flour Mill, Landskrona, Sweden.

RYE FLOUR, AND FLOUR FROM WINTER WHEAT.

*Report.*—Commended for rye flour of fair and of good color; also for flour from winter wheat of very fine color, some of which was of good strength and adapted for general consumption, while that with trade mark "o o" was of fair strength, making good bread, but especially adapted for biscuit and pastry.

## 131. Juan José Velasco, Santiago, Chili.

FLOUR.

*Report.*—Color fine, strength great; adapted for general consumption, without any special qualities.

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## 132. Ernesto Silvester, Milipilla, Chili.

FLOUR.

*Report.*—Color fine, strength great; adapted for general consumption, without any special qualities.

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## 133. McLeran Brothers, Portland, Oregon, U. S.

OATMEAL.

*Report.*—Commended for the good quality and sound condition of the product.

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## 134. John F. Tyrrell &amp; Co., New York, N. Y., U. S.

OATMEAL FROM NATIVE GRAIN.

*Report.*—Commended for the following reasons:

- 1st. Great variety, adapting it to several forms of food preparation.
  - 2d. Soundness of the grain, and freedom from bran and other impurities.
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## 135. Wm. Field, Liverpool, England.

OATMEAL MADE FROM IRISH OATS.

*Report.*—Commended for the excellent quality of the food material.

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## 136. John McCann, Drogheda, Ireland.

OATMEAL.

*Report.*—Commended for the excellent quality of the product and the great extent of the manufacture.

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## 137. J. Hunter &amp; Son, Edinburgh, Scotland.

OATMEAL AND PEARL BARLEY.

*Report.*—Commended for the following reasons:

1. Good quality of the stock from which the articles are produced, to wit, Scotch oats and barley.
  2. Careful preparation, and good condition in which the articles are brought into market.
- 

## 138. James F. McKenzie, Melbourne, Victoria, Australia.

OATMEAL, GROATS, AND SPICES.

*Report.*—Commended for the good quality of the articles and their perfect soundness after so long a sea-voyage. Mustard, mixed spices, and ground cinnamon also of very good quality.

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## 139. Thomas McKay &amp; Co., Ottawa, Canada.

THREE SAMPLES OF OATMEAL (DIFFERENT GRADES).

*Report.*—Commended for the following reasons:

1. The variety in the product, adapting it to the several forms of food made from oatmeal.
2. The cleanness of the samples, and freedom from bran or foreign substances.

## REPORTS ON AWARDS.

## 140. H. Warton, Guelph, Canada.

## OATMEAL.

*Report.*—Commended for its good quality and low price.

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## 141. Aspden &amp; Pritchard, London, Canada.

## FOUR VARIETIES OF OATMEAL.

*Report.*—Commended for good quality of the product, and its great variety, adapting it to several forms of food.

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## 142. James Wilson, Fergus, Canada.

## OATMEAL.

*Report.*—Commended for the following reasons:

1. The sound condition of the grain.
  2. Its very clean preparation.
- 

## 143. E. D. Tilson, Tilsonsbury, Canada.

## OATMEAL AND BUCKWHEAT FLOUR.

*Report.*—Commended for the excellent quality of both products, and good condition in which they were exhibited.

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## 144. Scott &amp; Co., Highgate, Ontario, Canada.

## FOUR VARIETIES OF OATMEAL.

*Report.*—Commended for the following reasons:

1. The excellent quality of the stock from which the product was manufactured.
  2. The care used in the manufacture, producing a great variety of product of excellent quality.
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## 145. P. Francis, Brooklyn, Canada.

## OATMEAL (THREE SAMPLES, DIFFERENT VARIETIES).

*Report.*—Commended for the variety of products and their uniform good quality.

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## 146. Antonio Lopes da Silva, Oporto, Portugal.

## WHITE CORN MEAL.

*Report.*—A good sample of well prepared and cleaned pearl meal.

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## 147. Ascensio Jose dos Santos, Valença, Vianna do Castello, Oporto, Portugal.

## FIVE SAMPLES OF CORN MEAL.

*Report.*—Commended for the following reasons:

1. Variety in fineness and color of the samples, to suit the taste of customers.
  2. Soundness of the corn used in the manufacture.
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## 148. Joaquim Ribeiro Almeida, Oporto, Portugal.

## TWO SAMPLES OF CORN MEAL.

*Report.*—The meal was carefully ground and bolted, and made from sound corn.

**149. Municipality of Penafiel, Oporto, Portugal.**

YELLOW AND WHITE CORN MEAL.

*Report.*—Good samples of cheap and wholesome food.**150. Antonia José de Souza e Silva, Oporto, Portugal.**

TWO SAMPLES OF CORN MEAL—YELLOW AND WHITE.

*Report.*—Sound, carefully prepared, and well preserved.**151. José Francisco Serra de Egreja, Oporto, Portugal.**

TWO SAMPLES OF CORN MEAL.

*Report.*—Well made, from sound flinty corn; ground round, and not too fine.**152. Baltimore Pearl Hominy Co., Baltimore, Md., U. S.**

SAMP, HOMINY, BREAKFAST HOMINY, PEARL MEAL, CORN FLOUR, AND YELLOW MEAL.

*Report.*—Commended for the following reasons:

1. The great variety of the products.
2. The excellent quality of the articles manufactured.

**153. John Outcalt, Spottswood, N. J., U. S.**

PEARL MEAL, PEARL HOMINY, COARSE HOMINY, CORN GRITS, GRAHAM FLOUR, AND DECORTICATED WHEAT.

*Report.*—Commended for the following reasons:

1. Great variety of the manufacture.
2. Excellent quality of the several products.

**154. Alexander Hornly, Craigsville, Orange Co., N. Y., U. S.**

STEAM-COOKED AND CRUSHED OATS AND WHEAT.

*Report.*—1. It may be prepared for the table in ten minutes, having been previously steam-cooked and dried.

2. It furnishes a palatable, nutritious, and very digestible food.

**155. Lunt Brothers, New York, N. Y., U. S.**

AVENA, OR OAT GRITS.

*Report.*—Commended for the following reasons:

1. It is oats perfectly decorticated, and consequently free from the bitter taste peculiar to oat bran.
2. It cooks light and crisp, like rice, and retains the natural sweetness of the grain.

**156. August Aly, Hamburg, Germany.**

PEARL BARLEY, DECORTICATED GRAINS, AND CORN GRITS.

*Report.*—A clean and neat preparation of cereals, carefully put up for market.**157. E. J. Larrabee & Co., Albany, N. Y., U. S.**

STAPLE AND FANCY BISCUITS AND CRACKERS.

*Report.*—Commended for extent of variety and superior skill in manufacture.

## 158. Snider Brothers &amp; Co., Cincinnati, Ohio, U. S.

CREAM CRACKERS.

*Report.*—Commended for superior skill in manufacture.

## 159. Walter G. Wilson &amp; Co., Philadelphia, Pa., U. S.

PLAIN AND FANCY CRACKERS, CAKES, AND BISCUITS.

*Report.*—Commended for extent of variety, superior manufacture, and long-preserved excellence.

## 160. David Carrick &amp; Co., Philadelphia, Pa., U. S.

BISCUITS, CAKES, AND CRACKERS FOR FAMILY USE.

*Report.*—Commended for fine style, flavor, and substantial qualities.

## 161. Adam Exton &amp; Co., Trenton, N. J., U. S.

WATER, BUTTER, AND OYSTER CRACKERS.

*Report.*—Commended for delicious flavor and crispness, obtained by superior skill in working and baking.

## 162. Thurston, Hall, &amp; Co., Cambridgeport, Mass., U. S.

CAKES AND CRACKERS.

*Report.*—Commended for general excellence, extent of variety, uniformity, and cheapness.

## 163. Thorn &amp; Brother, Trenton, N. J., U. S.

PRODUCTS OF BAKERY.

*Report.*—Commended for fine display of biscuits and crackers.

## 164. John Hartman, Philadelphia, Pa., U. S.

BREAD FOR MARINE AND ARMY USE.

*Report.*—Commended for long retention of excellence, and for skill in manufacture.

## 165. T. B. Guest &amp; Co., Melbourne, Victoria, Australia.

FANCY BISCUITS.

*Report.*—Commended for excellence and extent of variety.

## 166. Smith &amp; Son, Melbourne, Victoria, Australia.

FANCY AND DESSERT BISCUIT.

*Report.*—Commended for excellence and extent of variety.

## 167. John Hardie, Sydney, New South Wales, Australia.

BISCUIT AND CRACKERS.

*Report.*—Commended for its well-preserved condition, indicating great skill in manufacture.

## 168. Christie, Brown, &amp; Co., Toronto, Canada.

BISCUIT AND CRACKERS.

*Report.*—Commended for general excellence.

## 169. Th. Rankin &amp; Sons, St. John, New Brunswick.

## HONEY BISCUIT.

*Report.*—Commended for fine quality and beautiful display.

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## 170. Koostaref, Viasma, Russia.

## CAKES.

*Report.*—Commended for superior quality and fine display.

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## 171. Koodriavzef Brothers, Moscow, Russia.

## CAKES.

*Report.*—Commended for beautiful ornamentation, excellent quality, and good state of preservation.

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## 172. Simon Saitzef, Moscow, Russia.

## CAKES AND GINGERBREAD.

*Report.*—Commended for beauty of style and well-preserved excellence.

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## 173. Basil Ootkin, Tver, Russia.

## CAKES.

*Report.*—Commended for variety and originality in style.

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## 174. Eduardo Conceição e Silva, Lisbon, Portugal.

## CRACKERS AND BISCUITS.

*Report.*—A fine collection, put up with great taste and care.

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## 175. Antonio Correia Araujo, Coimbra, Portugal.

## CRACKERS, BISCUITS, AND CAKES.

*Report.*—A splendid collection of crackers, biscuits, and cakes of every variety; well flavored and preserved.

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## 176. Antonio de Souza Matta Panperio, Vallongo, Oporto, Portugal.

## CRACKERS AND BISCUITS.

*Report.*—A good and generally well-preserved collection.

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## 177. João de Britto, Lisbon, Portugal.

## CRACKERS AND BISCUITS.

*Report.*—His navy biscuits are excellent, carefully put up, and very fresh.

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## 178. Jose Francisco Cruz, Coimbra, Portugal.

## BISCUITS, CRACKERS, AND CAKES.

*Report.*—His bolacha folhada (pate feni cletée) is wonderfully well preserved.

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## 179. Eduardo Antonio da Costa, Lisbon, Portugal.

## BISCUITS AND CRACKERS.

*Report.*—A fine collection, showing great taste and care.



**180. Adolpho Schurmann, Lisbon, Portugal.**

BISCUITS, CAKES, AND CRACKERS.

*Report.*—A very fine collection put up with the greatest taste.**181. Paulo da Silva Barboza, Oporto, Portugal.**

CRACKERS, BISCUITS, AND CAKES.

*Report.*—A very fine collection, tastefully prepared and well preserved.**182. M. S. Bagley, Buenos Ayres, Argentine Republic.**

CRACKERS, BISCUITS, AND CAKES.

*Report.*—A splendid collection, which does the greatest credit to the exhibitors. Nothing could be fresher and better preserved.**183. Fridolin Spreng, Grätz, Austria.**

BISCUITS.

*Report.*—Perfectly fresh, although they were baked five or six months since.**184. W. D. Ulrich, Rotterdam, Netherlands.**

SHIP BISCUIT.

*Report.*—Fine composition; well baked; very fine taste.**185. Lensvelt Nicola, The Hague, Netherlands.**

SHIP BISCUIT.

*Report.*—Well baked; fine composition; good taste.**186. H. J. Feith & Son, Upsala, Sweden.**

PATENT BREAD.

*Report.*—Commended for its delicious flavor and long keeping.**187. Jewell Brothers, Brooklyn, N. Y., U. S.**

INFANT FOOD.

*Report.*—This cereal food is very well prepared, and approaches as nearly as possible to supply the place of human milk.**188. John Wyeth & Brother, Philadelphia, Pa., U. S.**

PAPONA.

*Report.*—This new preparation is made from roasted wheat. It is very good, and can be recommended as infant and invalid food.**189. Geyelin & Co., London, England.**

CONCENTRATED FOOD, PREPARED IN PACKETS.

*Report.*—Commended for the following reasons: 1. Concentration of a large amount of nutritive matter in a very small compass; 2. Excellent flavor; 3. Successful preservation.

## 190. Groult, Jr., Paris, France.

COCOA IN POWDER, COCOA AND TAPIOCA, TAPIOCA AND FARINA, AND PASTES FOR SOUP.

*Report.*—A very fine cocoa in powder, mixed with a farina of tapioca; cocoa and tapioca of good flavor and well prepared; a fine Brazilian tapioca, manufactured with great care, and a fine collection of farina and pastes for soups, well prepared, fine flavor, and excellent quality.

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## 191. Ed. Loefflund, Stuttgart, Germany.

LIEBIG'S CONCENTRATED FOOD FOR INFANTS.

*Report.*—Commended as a substitute for mother's milk.

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## 192. State of Iowa, U. S.

CEREALS.

*Report.*—A very fine collection of cereals in the straw and beautifully cleansed; also grasses and seeds, sixty varieties. A fine collection, beautifully arranged. Also a very fine collection of seventy varieties of Indian corn.

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## 193. State of Kansas, U. S.

A COLLECTION OF GRAINS AND GRASSES.

*Report.*—A large and finely-arranged display of farm products, at their building on the Centennial grounds.

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## 194. David Landreth &amp; Sons, Philadelphia, Pa., U. S.

FIELD AND GARDEN SEEDS AND CEREALS.

*Report.*—Commended—1, for the extent of the exhibit, and the purity of the seeds, being one hundred and ninety varieties of garden and field seeds, twenty varieties of dried grasses, fifty varieties of forage plants, growing in pots, and fifty varieties of grain in the sheaf; 2, for the fact that the exhibitors grow their own seeds, on their own farms, located in the States of Virginia, New Jersey, Wisconsin, and Pennsylvania.

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## 195. State of Missouri, U. S.

CEREALS.

*Report.*—A fine exhibit of cereals, particularly wheat and corn, together with all the products of said grain.

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## 196. State of Oregon, U. S.

GRAINS, GRASSES, CEREALS, DRIED FRUITS, AND VEGETABLES.

*Report.*—Commended for the extent and excellent quality of exhibit of all the above-named products.

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## 197. State of Michigan, U. S.

WHEAT, OATS, RYE, CORN, BUCKWHEAT, AND GRASSES.

*Report.*—Commended for the fine appearance and good weight of twenty-one varieties of wheat, seventeen varieties of oats, two varieties of rye; also for exhibits of corn, grasses, and buckwheat.

**198. Commercial Exchange Association, Philadelphia, Pa., U. S.****CEREALS, FLOUR, MEATS, SEEDS, AND PRODUCTS OF CORN, WHEAT, AND RYE.**

*Report.*—A very fine collective exhibit, consisting of twenty-one samples of wheat, sixty-six samples of flour, representing ten States, sixteen samples of corn, fourteen samples of oats, two samples of rye, fifteen samples of barley; also very fine samples of lard, mess beef, pork, hams, etc., and a beautiful collection of seeds, of thirteen different varieties, beautifully and tastefully arranged.

**199. State of West Virginia, U. S.****CEREALS AND TOBACCO.**

*Report.*—A good display of wheat, corn, oats, rye, barley, and tobacco leaf, in the West Virginia Building on the Centennial grounds.

**200. Illinois Department of Agriculture, U. S.****CEREALS.**

*Report.*—A very fine exhibit of cereals, and with it an instructive exhibit showing the standard grades of State grain inspection of Chicago.

**201. W. O. Bush, Olympia, Washington Territory, U. S.****CEREALS.**

*Report.*—A very fine collection of cereals, wheat, rye, oats, and barley, and grasses, well cleaned, and in the straw.

**202. C. P. Burkhart, Albany, Oregon, U. S.****GRAINS.**

*Report.*—Fine exhibit of fifteen varieties of wheat, all of which appear to be good. The yield is said to be great,—thirty-seven to sixty bushels per acre. Also for an exhibit of Oregon white rye, very large grain, and straw nine feet high; five varieties of oats, all good and very heavy.

**203. The Cereals Manufacturing Co. of New York, Brooklyn, N. Y., U. S.****STEAM-COOKED AND DESICCATED CEREALS.**

*Report.*—A great variety of the products, to wit, oats, groats, decorticated wheat, wheat and barley mixed and crushed, and infant food, being chiefly the albumen and gluten of the grain nearly free from starch. Commended for the careful, neat, and convenient manner in which it is put up for market.

**204. Indian Museum, South Kensington, London, England.****CEREALS.**

*Report.*—Commended for the extent of its collection of seventy-five varieties of rice, in the husk, and cleansed; fifteen varieties of wheat, five varieties of oats, ten varieties of barley, seventy-five varieties of tea, twenty varieties of coffee, and a number of spices, and millet and grass seeds.

**205. South Australian Commission.****CEREALS AND GRASSES.**

*Report.*—A fine collection of grains, grasses, and farm seeds.

## 206. Angus Polson, Moyston, Victoria, Australia.

## CEREALS.

*Report.*—Commended for the great weight and very fine appearance of two varieties of wheat, one of oats, and one of barley.

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## 207. St. Arnaud Pastoral Society, St. Arnaud, Victoria, Australia.

## CEREALS.

*Report.*—Commended for great weight and very fine appearance of wheat, oats, and barley.

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## 208. E. H. Banks, Christ Church, New Zealand.

## CEREALS.

*Report.*—Commended for fine weight and appearance of rye and barley and oats of the most excellent quality.

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## 209. Robert Wilkens, Christ Church, New Zealand.

## GRASS SEED.

*Report.*—Beautiful samples of rye grass and cocksfoot grass seed.

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## 210. C. F. Creswell, Hobart-Town, Tasmania.

## CEREALS.

*Report.*—Commended for the fine appearance and good weight of five varieties of wheat and one of oats; also for lucerne and white clover seed, well cleansed and genuine.

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## 211. William Smith, Fairfield Plains, Brant Co., Ontario, Canada.

## CLOVER SEED.

*Report.*—Commended for the cleanliness and genuineness of "Alseke" clover seed.

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## 212. T. M. Howser, Campden, Lincoln Co., Ontario, Canada.

## CLOVER SEED.

*Report.*—Commended for the good appearance, uniformity, and genuineness of red clover seed.

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## 213. Stanislas Iastrzemsky, Pinczow, Kelce, Russia.

## CEREALS.

*Report.*—Commended for the good appearance and weight of wheat, oats, and barley.

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## 214. Prince Victor Vassiltchikof, Lebedian, Tambov, Russia.

## CEREALS.

*Report.*—Commended for fine appearance and weight of rye and oats.

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## 215. David Bell, St. Petersburg, Russia.

## CEREALS.

*Report.*—Commended for good appearance and weight of oats, barley, rye, and timothy

## 216. A. Warshawski, St. Petersburg, Russia.

## CEREALS.

*Report.*—A fine collection of cereals,—wheat, rye, oats, and barley; all of good weight and fine appearance.

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## 217. Henrietta Dengink, Kichinef, Bessarabia, Russia.

## CEREALS.

*Report.*—Commended for good weight and appearance of Indian corn, hulled barley, and German mohair.

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## 218. Imperial Maritime Customs, China.

## CEREALS.

*Report.*—Commended for a large collection of different varieties of rice; also wheat, barley, millet, Indian corn, and grass seeds.

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## 219. Charles Dumontier, Claville, Eure, France.

## CEREALS.

*Report.*—A fine and large collection of cereals, both in the ear and grain, as well as a variety of grasses grown by the exhibitor on his model farm.

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## 220. Francisco Domingo Ganga, Barcelona, Spain.

## CEREALS AND SEEDS.

*Report.*—Commended for a fine collection of cereals, grasses, and beans, with complete tabular statements showing mode of cultivation, system of rotation, etc.; and for the improvements made in the products by this system.

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## 221. Bua Agostino do Roches, Penafiel, Oporto, Portugal.

## MILLET.

*Report.*—A fine sample of well-cleaned, full-grain, horse millet seed.

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## 222. Government of Mexico.

## CEREALS.

*Report.*—Commended for a large collection of cereals, grasses, coffee, chocolate, etc.

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## 223. Commission for the Province of Pará, Brazil.

## URUCU (BIXA ORETHANA).

*Report.*—A new spice, which flavors food and at the same time communicates a rich scarlet color to it.

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## 224. Government of the Argentine Republic.

## CEREALS.

*Report.*—Commended for the extent and variety of its collection of cereals, grasses, and grass seeds.

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## 225. Overvoorde &amp; Son, Delft, Netherlands.

## GRASS SEEDS.

*Report.*—A fine exhibit of various grass seeds.

## 226. Chr. Schiröd, Aker, Norway.

## CEREALS.

*Report.*—A good collection of cereals—wheat, rye, oats, and barley—grown in sixty degrees north latitude.

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## 227. Agricultural Society of the Län of Norrbotten, Luleå, Sweden.

## CEREALS.

*Report.*—Commended in that good grain is grown by them so far north as sixty-seven degrees north latitude.

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## 228. G. von Scheele, Kilanda, Goteborg, Sweden.

## CEREALS AND GRASSES.

*Report.*—A fine collection of cereals and the flour of said cereals; decorticated grains, with clover and grasses.

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## 229. O. E. Stenström, Gårdsjö, Karlstad, Sweden.

## CEREALS.

*Report.*—A fine collection of grains,—wheat, rye, and barley,—clean and in the straw.

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## 230. H. A. Wulff, Kalmar, Sweden.

## CEREALS.

*Report.*—A fine collection of grains and grasses.

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## 231. Agricultural Society of Chill.

## CEREALS.

*Report.*—Commended for the extent and variety of its collection of cereals, some of which are fine.

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## 232. D. D. Prettyman, Salem, Oregon, U. S.

## WHEAT.

*Report.*—A fine exhibit of ninety-day white wheat, sheaf and grain.

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## 233. Captain William Delf, Great Bentley, Colchester, England.

## WHEAT.

*Report.*—Commended for fine appearance and good weight.

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## 234. Thos. Rossi, Dry Diggings, Victoria, Australia.

## WHEAT.

*Report.*—Commended for fine appearance and good weight.

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## 235. Thos. O'Reilly, Toolamba, Victoria, Australia.

## WHEAT.

*Report.*—Commended for good weight and fine appearance.

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## 236. James Catlin, Runnymede, Victoria, Australia.

## WHEAT.

*Report.*—Commended for the great weight and fine appearance of two varieties.

## 237. Jas. Adams, Warring, Victoria, Australia.

WHITE TUSCAN WHEAT.

*Report.*—Commended for fine appearance and great weight.

## 238. Ararat Flour Mill Co., Ararat, Victoria, Australia.

WHEAT.

*Report.*—Commended for good appearance and great weight.

## 239. John Moncrieff, Goulburne River, Victoria, Australia.

WHEAT.

*Report.*—Commended for the good weight and fine appearance of three varieties.

## 240. George Smith, Ballarat, Victoria, Australia.

WHEAT AND RYE GRASS SEED.

*Report.*—Commended for good weight and very fine appearance of wheat; also for good exhibit of rye grass seed.

## 241. J. McNab, Tabilk, Victoria, Australia.

WHEAT.

*Report.*—Commended for good weight and appearance.

## 242. Andrew O'Keefe, Adelaidevale, Victoria, Australia.

WHEAT.

*Report.*—Commended for the great weight and very fine appearance of two varieties.

## 243. T. S. Wright, Rochester, Victoria, Australia.

WHEAT.

*Report.*—Commended for great weight and very fine appearance.

## 244. Edward Buckley, Newbridge, Victoria, Australia.

WHEAT AND OATS.

*Report.*—Commended for the great weight and beautiful appearance of four samples of red straw wheat, said to have grown on different soils; also for very fine oats.

## 245. James Scott, Indigo, Victoria, Australia.

WHEAT.

*Report.*—Commended for fine appearance and good weight.

## 246. P. Cunningham &amp; Co., Christ Church, New Zealand.

WHEAT.

*Report.*—Commended for the very fine appearance and very great weight of four varieties of wheat.

## 247. W. D. Wood, Christ Church, New Zealand.

WHEAT.

*Report.*—Commended for the fine appearance and good weight of four varieties.

## 248. W. H. D. Archer, Longford, Tasmania.

WHEAT.

*Report.*—Commended for fine appearance and good weight.

## 249. George Kemp, Upper Bagdad, Tasmania.

WHITE WHEAT.

*Report.*—Commended for fine appearance and good weight.

## 250. Barry, Arnold, &amp; Co., Cape Town, Cape of Good Hope.

WHEAT.

*Report.*—Commended for good appearance and weight.

## 251. N. Mybury, Meerlust, Cape Colony, Cape of Good Hope.

WHEAT.

*Report.*—Commended for very fine appearance and great weight.

## 252. Dalton Brothers, Orange, New South Wales, Australia.

WHEAT.

*Report.*—Commended for good weight and fine appearance.

## 253. Thos. I. Skinner, Cowitcher, British Columbia.

WHEAT.

*Report.*—Commended for the good condition of red chaff wheat.

## 254. Indians of Douglass Lake, British Columbia.

WHEAT.

*Report.*—Very fine sample of red chaff wheat.

## 255. Mission of Chipegan, Lake Alataska, British Columbia.

WHEAT AND BARLEY.

*Report.*—Fine samples of wheat and barley raised in 58° 42' north latitude.

## 256. Jas. Collins, Erin, Ontario, Canada.

WHEAT.

*Report.*—Commended for the good condition and weight of "Rio Grande" wheat.

## 257. R. Sugg, Minto, Ontario, Canada.

WHEAT.

*Report.*—Commended for the good condition and weight of "Scotch" wheat.

## 258. Jno. Campbell, Hullett, Ontario, Canada.

WHEAT.

*Report.*—Commended for the fine condition and weight of "Fife" wheat.



## 259. Wm. McGill, York County, Ontario, Canada.

WHEAT.

*Report.*—Commended for the good weight and condition of "Soules" wheat.

## 260. James Bell, Tuckersmith, Ontario, Canada.

WHEAT.

*Report.*—Commended for the good condition and weight of "club" wheat.

## 261. William Bell, Tuckersmith, Ontario, Canada.

WHEAT.

*Report.*—Commended for the good condition and weight of Tarrow wheat.

## 262. Jas. H. Murton, Salesbury, New Brunswick.

WHEAT.

*Report.*—Commended for good weight and condition of wheat.

## 263. Robert Schearer, Niagara, Ontario, Canada.

WHEAT.

*Report.*—Commended for the very fine condition and good weight of Delhi and Fife wheat.

## 264. Matthew Mearns, Durham, Ontario, Canada.

WHEAT.

*Report.*—Commended for good condition and weight of "Treadwell" wheat.

## 265. Wm. P. O'Neal, Watertown, Ontario, Canada.

WHEAT.

*Report.*—Commended for good condition and weight of "Treadwell" and "white winter" wheat.

## 266. T. Manderim, Myrtle, Ontario, Canada.

WHEAT.

*Report.*—Commended for the good condition of Delhi wheat, weighing sixty-five pounds per bushel.

## 267. R. McGill, Erin, Ontario, Canada.

WHEAT.

*Report.*—Commended for the excellent condition and weight of "Treadwell" wheat.

## 268. W. P. Howland, Toronto, Ontario, Canada.

WHEAT.

*Report.*—Commended for the good condition and weight of "Rio Grande" wheat.

## 269. R. Tuck, Nelson, Ontario, Canada.

WHEAT.

*Report.*—Commended for good condition of Delhi wheat, weighing sixty-three and a half pounds per bushel.

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## 270. Wm. Beattie, Nickol, Ontario, Canada.

WHEAT.

*Report.*—Commended for fine condition and good weight of "Fife" wheat.

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## 271. Samuel Dawes, Whitby, Ontario, Canada.

WHEAT.

*Report.*—Commended for the excellent condition of "Delhi" wheat, weighing sixty-five pounds per bushel.

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## 272. Jacob Seip, Petersburg, Ontario, Canada.

WHEAT.

*Report.*—Commended for the good condition and weight of "red chaff" wheat.

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## 273. Alex. Stewart, Brussels, Ontario, Canada.

WHEAT.

*Report.*—Commended for the good condition and weight of "club" wheat.

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## 274. Ookhin Brothers, Novouzen, Samara, Russia.

WHEAT.

*Report.*—Commended for very fine appearance and weight.

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## 275. P. Plighm, Volsk, Saratof, Russia.

WHEAT.

*Report.*—Commended for fine appearance and weight of three varieties of wheat.

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## 276. John Penzin, Samara, Russia.

WHEAT.

*Report.*—Commended for fine appearance and good weight.

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## 277. Pleshanof, Samara, Russia.

WHEAT.

*Report.*—Commended for fine appearance and weight.

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## 278. Alexis Ermolof, Arkhangelskoie, near Voronesh, Russia.

WHEAT.

*Report.*—Commended for fine weight and appearance.

**279. Kharkof Model Farm, near Kharkof, Russia.**

WHEAT; GRASS SEEDS.

*Report.*—Commended for good appearance and weight of wheat, and for a variety of grass seeds, well cleansed.

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**280. Kobzaref Brothers, Novouzen, Samara, Russia.**

WHEAT.

*Report.*—Commended for very fine appearance and good weight of wheat.

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**281. Paul Obratnof, Uralsk, Russia.**

WHEAT.

*Report.*—Commended for good weight and fine appearance.

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**282. Leon Chudaca, Algiers.**

WHEAT AND BARLEY.

*Report.*—Wheat of large, uniform, beautiful, and hard grain, and fine barley.

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**283. Rafael Crespo, Utrera, Seville, Spain.**

WHEAT.

*Report.*—Commended for good condition and weight.

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**284. Manuel Jimenez, Carmona, Seville, Spain.**

WHEAT.

*Report.*—Commended for good condition and weight.

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**285. José R. Fernandez, Huelva, Spain.**

WHEAT.

*Report.*—Commended for good condition and weight.

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**286. Loring Brothers, Malaga, Spain.**

WHEAT.

*Report.*—Commended for good condition and weight. •

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**287. Municipality of Lucena, Lucena, Cordoba, Spain.**

WHEAT.

*Report.*—Commended for good condition and weight.

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**288. Miguel Gonzales Delgado, Ragama, Salamanca, Spain.**

WHEAT.

*Report.*—Commended for good condition and weight of candeal wheat.

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**289. Manuel Lambas, Avila, Spain.**

WHEAT.

*Report.*—Commended for good condition and weight of candeal wheat.

**290. Gaspar Diaz, Cabezas del Pozo, Avila, Spain.**

WHEAT.

*Report.*—Commended for good condition and weight of candeal wheat.**291. Gaspar Diaz, Salamanca, Spain.**

WHEAT.

*Report.*—Commended for good condition and weight of candeal wheat.**292. Manuel Zayas Arahál, Seville, Spain.**

WHEAT.

*Report.*—Commended for good condition and weight.**293. Bernardo Nava Rodriguez, Sanga, Avila, Spain.**

WHEAT.

*Report.*—Commended for good condition and weight of candeal wheat.**294. Rafael Vallejo, Cordoba, Spain.**

WHEAT.

*Report.*—Commended for good condition and weight (best exhibited from Spain).**295. Juan Borrego Jago, Ronda, Malaga, Spain.**

WHEAT.

*Report.*—Commended for good condition and weight.**296. José Avio Gros, Candasnos, Zaragoza, Spain.**

WHEAT.

*Report.*—Commended for good condition and weight of "Fuerti" wheat.**297. Steam Bread Bakery of the Mendicity Asylum, Lisbon, Portugal.**

PROCESS OF CLEANING WHEAT.

*Report.*—A very thorough and economical method of cleaning wheat, separating the grain, even when mixed with all sorts of foreign substances, in a very clean condition, while the admixtures are so separated that any part of the same may be utilized.**298. Francisco Loureiro Teixeira, Campello, Oporto, Portugal.**

WHEAT.

*Report.*—Commended for very good weight and good appearance.**299. João Antonio de Carvalho, San João do Porto de Mozheiro, Portugal.**

WHEAT.

*Report.*—Commended for good weight and appearance.

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300. **Filippe de Jesus Rijo, Elvas, Portalegre, Portugal.**

WHEAT.

*Report.*—Commended for good weight and very good appearance.

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301. **Antonio Ferreira dos Santos, Rio Tonto, Gondomar, Oporto, Portugal.**

WHEAT.

*Report.*—Commended for good weight and appearance.

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302. **Joaquim Ribeiro da Silva, Vallonga, Oporto, Portugal.**

WHEAT.

*Report.*—Commended for good weight and appearance.

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303. **André Guilherme Chichorro, Monforte, Portalegre, Portugal.**

WHEAT.

*Report.*—Commended for very good weight and good appearance.

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304. **Francisco de Paulo Xavier, Benavente, Santarem, Portugal.**

WHEAT.

*Report.*—Commended for good weight and appearance.

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305. **Francisco Antonio Pereira de Lemos, Alfandega da Fe, Bragança, Portugal.**

WHEAT.

*Report.*—Commended for good weight and appearance.

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306. **Miguel Joaquim Caldeira, Herdade de Pina Clara, Elvas, Portugal.**

WHEAT.

*Report.*—Commended for very good weight and good appearance.

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307. **João Joaquim Bagulho, Villa Boim, Elvas, Portalegre, Portugal.**

WHEAT.

*Report.*—Commended for fine appearance and good weight.

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308. **Widow Marques & Sons, Lisbon, Portugal.**

WHEAT.

*Report.*—Commended for good weight and appearance.

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309. **João dos Santos Coelho, Lamego, Vizeu, Portugal.**

WHEAT.

*Report.*—Commended for good weight and appearance.

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310. **Jose Gomes Varella, Jr., Serpa, Beja, Portugal.**

WHEAT.

*Report.*—Commended for good weight and appearance.

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**311. Manoel Ribero Rua, Lamego, Vizeu, Portugal.**

WHEAT.

*Report.*—Of very good weight and appearance.**312. Exequiel Augusto de Vasconcellos, Elvas, Portalegre, Portugal.**

WHEAT.

*Report.*—Commended for good weight and appearance.**313. Antonio Augusto Correa da Silva Cordosa, Cellorico, Guarda, Portugal.**

WHEAT.

*Report.*—Commended for good weight and appearance.**314. Jose Clemente Pinto, Santa Cruz, Coimbra, Portugal.**

WHEAT.

*Report.*—Commended for fine weight and good appearance.**315. Manoel Diogo Coelho, Castello de Vide, Portalegre, Portugal.**

WHEAT.

*Report.*—Commended for good weight and very fine appearance.**316. Company das Lezírias do Tejo e Sado, Lisbon, Portugal.**

WHEAT.

*Report.*—Commended for good weight and fine appearance.**317. João de Bretto, Lisbon, Portugal.**

WHEAT.

*Report.*—Commended for good weight and appearance.**318. Fersouz, Adana, Turkey.**

WHEAT.

*Report.*—Commended for good weight and appearance of hard wheat.**319. Seid Mohammed, Angora, Turkey.**

WHEAT.

*Report.*—A fine sample of large plump grain, but, unfortunately, not enough to weigh.**320. A. S. van Burg, Middelburg, Netherlands.**

WHEAT.

*Report.*—Commended for good appearance and weight.**321. W. van der Monde, Bommel, Netherlands.**

WHEAT.

*Report.*—Commended for good appearance and weight of two samples.

## 322. D. Jongejans, Assendelft, Netherlands.

WHEAT.

*Report.*—Commended for good appearance and fair weight of red wheat.

## 323. Joaquin Lira, Colchagua, Chili.

WHEAT.

*Report.*—Commended for the good appearance and weight of two varieties.

## 324. George Down, Darling Downs, Queensland, Australia.

BARLEY.

*Report.*—Commended for fine appearance and good curl.

## 325. Joseph Myring, Campbell Creek, Victoria, Australia.

BARLEY.

*Report.*—Commended for great weight and fine appearance.

## 326. George Stonehouse, Scarboro, York County, Canada.

BARLEY.

*Report.*—Commended for the very fine condition of two-rowed barley.

## 327. Fidel Quintana y Ruiz, Burgos, Spain.

BARLEY.

*Report.*—Commended for good condition and weight.

## 328. J. Breebaart Kzn, Winkel, Netherlands.

BARLEY.

*Report.*—Commended for good weight and appearance.

## 329. Dutch Agricultural Society of the Province of Zealand, Middelburg, Netherlands.

BARLEY.

*Report.*—Commended for good weight and appearance.

## 330. Peyton King, Lafayette County, Miss., U. S.

CORN.

*Report.*—Commended for soundness of grain and size of ear of white corn.

## 331. Sir William MacArthur, Camden, New South Wales, Australia

CORN.

*Report.*—Commended for good weight and appearance of three varieties of Indian corn.

## 332. Rafael Gonzales, Seville, Spain.

CORN.

*Report.*—Commended for large plump grain and good weight of corn.

## 333. Manuel Pereiro Rey, Celanova, Orense, Spain.

CORN.

*Report.*—Commended for large plump grain and good weight.

## 334. Count of Vega Grande, Las Palmas, Canary Islands.

CORN.

*Report.*—Commended for large plump grain and good weight.

## 335. Juan Ojeda y Gomez, Seville, Spain.

CORN.

*Report.*—Commended for large plump grain and good weight.

## 336. Fernando Ralatin y Moreno, Seville, Spain.

CORN.

*Report.*—Commended for large plump grain and good weight.

## 337. Provincial Board of Agriculture, Castellon, Spain.

CORN.

*Report.*—Commended for large plump grain and good weight.

## 338. Ascencio José dos Santos, Vianna do Castello, Portugal.

INDIAN CORN.

*Report.*—Large, plump, heavy grain; bright and clear.

## 339. Jose de Vasconcellos Carneiro Menezes, Oporto, Portugal.

INDIAN CORN.

*Report.*—Fine samples of yellow and white corn. Commended for good weight and full grain.

## 340. Antonio Joaquim Fernandes Lima, Vianna do Castello, Portugal.

INDIAN CORN.

*Report.*—Commended for good weight and large plump grain.

## 341. Manoel de Souza Rangel, Penafiel, Oporto, Portugal.

INDIAN CORN.

*Report.*—Commended for good weight and large grain of uniform size.

## 342. Administrator of Conselho de Guimaraes, Braga, Portugal.

INDIAN CORN.

*Report.*—Of good weight and plump grain.

## 343. Andrew Gilmour, Colvinsky, Victoria, Australia.

OATS.

*Report.*—Commended for the fine appearance and great weight of three varieties.



## 344. Thos. Manderson, Myrtle, Ontario, Canada.

OATS.

*Report.*—Commended for the good appearance and weight of “surprise” oats.

## 345. Chas. Anderson, Hastings, Ontario, Canada.

OATS.

*Report.*—Commended for the good appearance and weight of “surprise” oats.

## 346. Mrs. Jane Taylor, York, New Brunswick.

OATS.

*Report.*—Commended for the very fine appearance and weight (forty-nine pounds per bushel) of white oats.

## 347. Lamus Smith, Chatham, Ontario, Canada.

OATS.

*Report.*—Commended for the fine appearance and weight of black oats.

## 348. C. H. Moyer, Campden, Ontario, Canada.

BOHEMIAN OATS.

*Report.*—Commended for the good appearance and great weight of hull-less or Bohemian oats.

## 349. The Advisory Board of Prince Edward's Island, Charlottetown.

OATS.

*Report.*—Commended for the very fine appearance and weight of white oats.

## 350. Dookhinof Brothers, St. Petersburg, Russia.

OATS.

*Report.*—Commended for good appearance and weight.

## 351. J. Breebaart Kzn, Winkel, Netherlands.

OATS.

*Report.*—Commended for good weight and appearance.

## 352. C. B. Rogers, Philadelphia, Pa., U. S.

RYE.

*Report.*—Commended for large grain and great weight (fifty-nine pounds per bushel) of Nevada rye.

## 353. John Stewart, Horton, Renfrew, Canada.

RYE.

*Report.*—Commended for good appearance and weight.

## 354. John Novosiltzef, Voin, Orel, Russia.

RYE AND BARLEY.

*Report.*—Commended for good appearance and weight.

355. D. Paulina Poveda, Pedroso, Salamanca, Spain.

RYE.

*Report.*—Commended for very good weight and appearance.

356. Francisco de Lemos Cunha, Vieira, Evora, Portugal.

RYE.

*Report.*—Commended for very good weight and appearance.

357. Jose Antonio Diaz Inchado, Morvão, Portalegre, Portugal.

RYE.

*Report.*—Commended for good weight and appearance.

358. Jose Maria Casqueiro, Crato, Portalegre, Portugal.

RYE.

*Report.*—Commended for good weight and appearance.

359. Francisco Martins Saraiva, Belmonte, Castello Branco, Portugal.

RYE.

*Report.*—Commended for good weight and large, full grain.

360. Christo, Yanina, Turkey.

RYE, BARLEY, AND MILLET.

*Report.*—Commended for good weight and appearance of barley and rye, and well cleaned millet seed.

361. B. Biesheuvel, Haarlemmermeer, Netherlands.

RYE.

*Report.*—Commended for good weight and appearance.

362. Jhr. J. P. Six, 's Graveland, Netherlands.

BUCKWHEAT.

*Report.*—Commended for very good weight and appearance of buckwheat.

363. M. Besselink, Hummeloo, Netherlands.

BUCKWHEAT.

*Report.*—Commended for good weight and appearance.

364. William B. Burk & Co., Philadelphia, Pa., U. S.

AMERICAN SPONGES FROM THE FLORIDA COAST.

*Report.*—Commended for variety and general good quality.

365. R. H. Sawyer & Co., Bahama Islands.

A COLLECTION OF SPONGES.

*Report.*—Commended for the good quality of the sponges, and the extent of the collection, to wit: sheep's-wool sponges, yellow sponges, velvet sponges, grass sponges, and reef sponges.

**366. S. Themeli, Calimnos Island, Turkey.**

## SPONGES.

*Report.*—Sponges of the island of Calimnos (Turkey). The exhibitor employs the best divers to collect the choicest kinds. His collection is the best to be found, is carefully selected and well cured.

**367. The Bey of Tunis.**

## A COLLECTIVE EXHIBIT.

*Report.*—A collection of sponges of several varieties, samples of yellow and white corn (Z. maize), and specimens of wheat grown in Tunis.

**368. N. Carantonis, Calimnos Island, Turkey.**

## SPONGES.

*Report.*—They are of the finest quality, well prepared and carefully selected by the exhibitor, consisting of fifteen varieties from the sea-shore of the Mediterranean, and particularly from the islands of Calimnos and Candia.

**369. American Condensed Milk Co., New York, N. Y., U. S.**

## CONDENSED MILK.

*Report.*—Commended for richness and natural taste of the milk.

**370. John Gail Borden, New York, N. Y., U. S.**

## CONDENSED MILK (EAGLE BRAND).

*Report.*—Commended for richness and natural taste of the milk.

**371. Hooker's Cream Milk Co., London, England.**

## CONDENSED MILK.

*Report.*—Well conserved; taste and color very good.

**372. Guillermo Fábriques, Mahon, Balearic Islands.**

## CONDENSED MILK WITH COFFEE AND SUGAR.

*Report.*—Well condensed and in good proportions.

**373. Norwegian Condensed Milk Co., Christiania, Norway.**

## CONDENSED MILK.

*Report.*—Commended for good preservation and very marked milk taste.

**374. Swiss Condensed Milk Co., Fribourg, Switzerland.**

## CONDENSED MILK.

*Report.*—Commended for good preservation, color, and taste.

**375. Thomas J. Purcell, Sharon Hill, N. Y., U. S.**

## HOPS OF 1876.

*Report.*—Among the samples of hops grown this year and offered for competition, this sample is found nearly perfect.

## 376. A. Clock, St. Helena, Napa County, Cal., U. S.

HOPS OF 1876.

*Report.*—Among the samples of hops grown this year and competing for prizes, this sample was pronounced the best as to brightness, picking, flavor, strength, and curing.

## 377. P. S. Risley, Waterville, N. Y., U. S.

HOPS OF 1876.

*Report.*—Among the samples of hops grown this year competing for prizes, this sample is pronounced almost perfect in all essential points.

## 378. A. S. Murphy, Cooperstown, N. Y., U. S.

HOPS OF 1876.

*Report.*—Among the samples of hops grown this year competing for prizes, this sample is pronounced nearly perfect in all essential points.

## 379. A. D. Stanley, Smithville, Jefferson County, N. Y., U. S.

HOPS OF 1876.

*Report.*—Among the samples of hops grown this year offered for competition, this sample is found nearly perfect.

## 380. Storey Brothers, St. Helena, Napa Valley, Cal., U. S.

HOPS OF 1876.

*Report.*—Among the samples of hops grown this year and offered for competition, this sample is found nearly perfect.

## 381. Sahlmann Brothers, Fürth, Bavaria, Germany.

BAVARIAN AND BOHEMIAN HOPS.

*Report.*—Commended for good condition and appearance.

## 382. City Council of Spalt, Germany.

BAVARIAN HOPS.

*Report.*—The undoubted merit of the celebrated Bavarian hops found the fullest appreciation, and gave a high idea of the excellent culture of the hops in that country.

## 383. C. Homann, Nuremberg, Germany.

GAZETTE FOR HOPS.

*Report.*—Commended for the great merit of his publications and his statistical and geographical researches.

## 384. Dreyfuss &amp; Binswanger, Munich and Nuremberg, Germany.

HOPS.

*Report.*—Commended for sound condition and good appearance.

## 385. Tanzer Brothers, Prague, Bohemia, Austria.

HOPS.

*Report.*—Commended for good condition and appearance.

## 386. S. Liebmann's Sons, Brooklyn, N. Y., U. S.

MALT.

*Report.*—Excellent quality; fine, even color; very sweet.

## 387. Charles Pope, Chicago, Ill., U. S.

MALT.

*Report.*—Commended for very good quality of malt made from Canada, Minnesota, and California barley; especially that of the last named.

## 388. Theodore Bergner, Philadelphia, Pa., U. S.

MALT.

*Report.*—Commended for purity, equality, color, and good sweet taste.

## 389. A. C. Hudson &amp; Marsh, Buffalo, N. Y., U. S.

MALT.

*Report.*—Commended for excellent quality.

## 390. Charles W. Pardee, Oswego, N. Y., U. S.

MALT.

*Report.*—Very fine; full; clear in color; very saccharine.

## 391. Thomas Palin, Brooklyn, N. Y., U. S.

MALT.

*Report.*—Very fine color of malt, meriting full recognition.

## 392. R. P. Slater, Galt, Ontario, Canada.

MALT.

*Report.*—Commended for superior quality.

## 393. Howard &amp; Northwood, Chatham, Canada.

MALT.

*Report.*—Very fine and clean.

## 394. John Labatt, London, Canada.

MALT.

*Report.*—Excellent in quality.

## 395. Jules Guilbert, Saint-Omer (Pas-de-Calais), France.

MALT.

*Report.*—Five varieties of malt, from five different parts of France. The germination is perfect, and, although on exhibition since the opening, the qualities are just the same as when exported from France.

## 396. Leipsic Malt Co., Saxony, Germany.

## MALT.

*Report.*—Prepared from superior barley; the malt is distinguished by a great amount of saccharine matter.

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## 397. Mittler &amp; Co., Brünn, Austria.

## MALT.

*Report.*—Commended for good condition and appearance.

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## 398. C. L. Nozicska &amp; W. Umgetter, Brünn, Austria.

## MALT.

*Report.*—Commended for excellent condition and appearance.

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## 399. M. Kaufmann, Brünn, Austria.

## MORAVIAN MALT.

*Report.*—Commended for superior quality.

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## 400. Solnitzky &amp; Mittler, Brünn, Austria.

## MALT.

*Report.*—Commended for sound condition and good appearance.

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## 401. A. Paillet &amp; Co., Epernay, France.

## CORKS.

*Report.*—Corks grown in Spain; cut and shaped at Epernay for corking champagne wines; good and sound.

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## 402. Gen. J. T. A. Brant, Minas Geraes, Brazil.

## VANILLA.

*Report.*—A good product.

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## 403. National Museum, Cairo, Egypt.

## A COLLECTIVE EXHIBIT.

*Report.*—The collection consists of native ivory,—various articles manufactured from the horn of the rhinoceros, and cups and ornaments made from bone.

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## 404. Benningfield &amp; Son, Cape of Good Hope.

## NATIVE IVORY (ELEPHANTS' TUSKS).

*Report.*—Commended for the large size and perfect soundness of the specimens exhibited.

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## 405. Chisolm's Rice Mill, Charleston, S. C., U. S.

## RICE.

*Report.*—Commended for the fine appearance of this exhibit, showing good grain, well cleaned.

## 406. Sociedad La Edetana, Valencia, Spain.

## RICE.

*Report.*—A fine exhibit of several varieties of rice in the straw and cleaned (beautifully cleansed), together with all the products of the rice.

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## 407. Regino Garcia, Manila, Philippine Islands.

## RICE.

*Report.*—Commended for the extent and variety of the exhibit, and excellence of some of the products, the exhibit comprising one hundred and twenty varieties of rice.

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## 408. Portuguese Government, Portugal.

## RICE.

*Report.*—A large collection of rices from the provinces of Angola, Cape de Verd, S. Thome and Principe, Goa, and Damao.

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## 409. Henrique Auguste Pereira, Setubal, Lisbon, Portugal.

## RICE.

*Report.*—Good, clear, well-cleansed grain.

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## 410. Vicente Ferreira Nunes, Lisbon, Portugal.

## RICE.

*Report.*—Two exhibits of well-cleansed rice, with large, even grain.

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## 411. Djebra Gaza, Aleppo, Turkey.

## RICE.

*Report.*—A good sample; heavy; well cleaned.

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## 412. Bernardino R. Carvalho, São Paulo, Brazil.

## RICE.

*Report.*—Commended for good quality and care in cleaning.

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## 413. Raymundo J. T. Valle, Maranhão, Brazil.

## RICE.

*Report.*—Commended for uniformity in size of grain, and care in cleaning.

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## 414. M. Antonio Guimarães, Paraná, Brazil.

## RICE.

*Report.*—Commended for good quality and careful cleaning.

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## 415. Ferrarini Riecardo &amp; Brothers, Modena, Italy.

## RICE.

*Report.*—Commended for the fine appearance of four varieties.

## 416. Secondo Malinverni, Vercelli, Novara, Italy.

RICE.

*Report.*—Commended for the size of grain and care taken in cleansing.

## 417. Donati Grioni &amp; Tensini, Crema, Italy.

RICE.

*Report.*—Commended for size and finish of grain.

## 418. United States Egg Desiccating Co., New York, N. Y., U. S.

CRYSTALLIZED EGG.

*Report.*—1. The product is dry and compact in form and easily transported.  
2. It is soluble in water or milk, and the solution retains all the properties of fresh eggs.

## 419. Geo. Upton, Boston, Mass., U. S.

GLUE.

*Report.*—A large and various exhibit of glues of fine appearance, of which three kinds are of excellent strength and purity.

## 420. Baeder, Adamson &amp; Co., Philadelphia, Pa., U. S.

GLUE.

*Report.*—This exhibit consists of four different preparations, for as many different purposes. They are all characterized by extraordinary strength, permanency, and sweetness.

## 421. Gaff, Fleischmann, &amp; Co., New York, N. Y., and Cincinnati, Ohio, U. S.

COMPRESSED YEAST.

*Report.*—The pressed yeast is a perfectly pure extract of selected grain, contributing to make a superior bread.

## 422. E. Mockridge &amp; Co., Philadelphia, Pa., U. S.

AZUMEA (A BAKING POWDER).

*Report.*—The preparation is made after a simple formula, and is an effective, cheap, and safe substitute for fermentation in bread-making.

## 423. Rumford Chemical Works, Providence, R. I., U. S.

BAKING POWDER.

*Report.*—Commended for the following reasons:

1. Its efficient action in rendering bread porous.
2. The acid used supplies phosphates, if these should be deficient in the food.
3. Less flour is required to make a given amount of bread in this manner than when fermented.

## 424. National Dry Hop Yeast Co., Seneca Falls, N. Y., U. S.

DRY HOP YEAST.

*Report.*—Commended for the following reasons:

1. The convenient form of the product.
2. The purity of the ingredients used in its manufacture.



**425. Royal Baking Powder Co., New York, N. Y., U. S.****ROYAL BAKING POWDER.**

*Report.*—Commended for the following reasons:

1. The acid and carbonate are used in such proportions that they exactly neutralize each other.
2. There is used in the compound such material that in the heat employed for baking it is resolved entirely into gas.
3. The entirely satisfactory results obtained by practical test.

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**426. Palmer Baking Powder Co., Philadelphia, Pa., U. S.****"JONES' UNRIVALED BAKING POWDER."**

*Report.*—It furnishes a convenient, cheap, and safe substitute for yeast in making bread and cake.

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**427. Waterloo Yeast Co., Waterloo, N. Y., U. S.****DRY HOP YEAST.**

*Report.*—Commended for the following reasons:

1. Freedom of the yeast from injurious substances or impurities.
2. The promptness with which it acts in producing fermentation.

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**428. George F. Gantz, New York, N. Y., U. S.****SEA-FOAM BAKING POWDER.**

*Report.*—Commended for the following reasons:

1. The prompt action in rendering bread porous.
2. The absence of anything injurious to health in the resulting compound.

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**429. Michael Ossipof, Kiev, Russia.****TALLOW.**

*Report.*—Very white, odorless, and consistent.

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**432. C. J. Fell & Brother, Philadelphia, Pa., U. S.****SPICES.**

*Report.*—A fine collection of spices, well chosen and carefully prepared.

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**431. Weikel & Smith Spice Co., Philadelphia, Pa., U. S.****SPICES.**

*Report.*—A large and very fine collection of a great variety of spices, very carefully prepared and put up pure and strong, and recommends itself very strongly.

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**430. C. J. Fell & Brother, Philadelphia, Pa., U. S.****MUSTARD.**

*Report.*—The two kinds of mustard are very carefully prepared, strong, and have a good natural flavor and color.

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**433. Weikel & Smith Spice Co., Philadelphia, Pa., U. S.****MUSTARD.**

*Report.*—Their mustard is excellent, pure, strong, and carefully put up.

## 434. Bonnett, Schenck, &amp; Earle, New York, N. Y., U. S.

## MUSTARD.

*Report.*—Their Massasoit mustard is clean, strong, and of good flavor, well ground and carefully put up.

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## 435. Wm. G. Dean, New York, N. Y., U. S.

## ARDENTER MUSTARD.

*Report.*—Their “Ardenter” mustard is carefully prepared, strong, and of good flavor.

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## 436. Keen, Robinson, Belleville, &amp; Co., London, England.

## MUSTARD.

*Report.*—Carefully prepared and put up.

---

## 437. George Berlinski, Warsaw, Russia.

## PREPARED MUSTARD.

*Report.*—Commended for very good flavor and careful preparation.

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## 438. Waag &amp; Sons, Doobovka, Saratov, Russia.

## MUSTARD.

*Report.*—Good, strong, fresh mustard.

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## 439. Christian Mueller, Doobovka, Saratov, Russia.

## MUSTARD.

*Report.*—Two fine samples of mustard; remarkably strong and fresh.

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## 440. Agricultural Commission, Brazil.

## CLOVE OF THE MARANHÃO (DICIPELLIUM).

*Report.*—The clove of the Maranhão is a spice much used by the confectioners.

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## 441. Maille &amp; Tandeau, Paris, France.

## MUSTARD, PICKLES, PRESERVED MUSHROOMS.

*Report.*—Their products are excellent in every way; flavor, color, freshness, and great care and taste in putting up.

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## 442. Commission for the Province of Maranhão, Maranhão, Brazil.

## CLOVE OF THE MARANHÃO—DICIPELLIUM CARYOPHYLLATUM.

*Report.*—This product is a spice much used in the confectionaries; delicious flavor and highly appetizing.

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## 443. The Municipality of Lisbon, Portugal.

## TALLOW OF THREE VARIETIES.

*Report.*—White, consistent, and entirely odorless.

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## 444. Cassard Brothers &amp; Co., Baltimore, Md., U. S.

## LARD OIL.

*Report.*—Lard oil for lubricating and burning; it has a clear color.

## 445. W. J. Wilcox &amp; Co., New York, N. Y., U. S.

## STEARINE AND LARD OIL.

*Report.*—1. The stearine deserves a special mention for being prepared without the use of chemical or other adulterations. It is extremely consistent, white, and tasteless. The use of this product is specially for hardening lard to be exported to warm and distant latitudes.

2. The lard oil is very white, sweet, and used for lubricating and burning. From its absolute purity it is even used for cooking purposes in Northern European countries.

## 446. P. T. George &amp; Co., Baltimore, Md., U. S.

## LARD OIL.

*Report.*—Lard oil for lubricating and burning; it has a sweet taste.

## 447. V. W. Macfarlane &amp; Co., New York, N. Y., U. S.

## REFINED LARD.

*Report.*—This lard is of good taste and well preserved.

## 448. W. J. Wilcox &amp; Co., New York, N. Y., U. S.

## REFINED LARD.

*Report.*—Commended for:

1. Its sweetness.
2. Its fine color.
3. Its being well prepared for exportation.

## 449. P. T. George &amp; Co., Baltimore, Md., U. S.

## REFINED LARD.

*Report.*—Their refined lard is white and sweet.

## 450. Geo. C. Napheys &amp; Sons, Philadelphia, Pa., U. S.

## REFINED LARD.

*Report.*—Commended for:

1. Good condition.
2. Good color.
3. Good flavor.

## 451. Pork-Packing Co., Copenhagen, Denmark.

## REFINED LARD.

*Report.*—Carefully put up in bladders for exportation. Commended for good taste and good color.

## 452. Diego Ojeda, Puerto Real, Cadiz, Spain.

## LICORICE.

*Report.*—Licorice in sticks; very clean and very pure; of unexceptionable aroma.

## 453. Flor Carenon y Tur, Zaragoza, Spain.

## LICORICE.

*Report.*—Of very good merchantable quality, fair aroma, and pure taste.

## 454. MacAndrews &amp; Co., Seville, Spain.

## LICORICE.

*Report.*—Well prepared, very pure, and of delicious fragrance.

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## 455. Antonio Viti, Cremona, Italy.

## TORRONE.

*Report.*—Commended for quality, price, and good condition. The Torrone corresponds with the white French nougat, and is of delicious taste.

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## 456. Luigi Cerri, Cremona, Italy.

## TORRONE.

*Report.*—The Torrone, known as French nougat, is a delicious sweetmeat. It has a very fine taste, and, being made entirely of almonds, sugar, and honey, is very healthy.

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## 457. Xavier Wertz, New York, N. Y., U. S.

## CONFECTIONERY.

*Report.*—The bouquet of flowers is a most perfect imitation of the natural flowers. The new bonbons are perfect.

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## 458. Joseph Combet, Champigny, near Paris, France.

## BONBONS.

*Report.*—French nougat, a compound of honey, almonds, and pistache; is a very good imitation of the celebrated Montélimart nougat. Peppermint and acidulated drops very good.

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## 459. L. Reinhardt &amp; Co., Paris, France.

## BONBONS.

*Report.*—"French bonbons;" pastilles à la violette et pastilles de Luchon; delicate taste.

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## 460. Geremia Viscardi, Bologna, Italy.

## CRYSTALLIZED FRUITS.

*Report.*—Commended for the specialty of crystallized fruits, which are of the best quality and in excellent condition, solid, and comparatively very cheap.

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## 461. Giovanni Profeta, Naples, Italy.

## CONFECTIONERY.

*Report.*—Very fine goods; of excellent quality, and in very good condition.

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## 462. Amato Brothers, Catania, Italy.

## CANDIED FRUITS AND CITRONS.

*Report.*—Very fine and well conditioned articles; comparatively very cheap and excellent, especially the candied citrons, which are magnificent.

## 463. Chev. Salvatore Guli, Palermo, Italy.

## CANDIED FRUITS AND CONFECTIONERY.

*Report.*—Commended for choice brands of articles exhibited which are sold very cheap.

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## 464. Gioacchino Loreti, Rome, Italy.

## ASSORTED CANDIES AND CONFECTIONERY.

*Report.*—Candies pure and very delicious.

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## 465. Contessini, Gerini, &amp; Co., Leghorn, Italy.

## CONFECTIONERY, CANDIED ORANGES AND LEMONS.

*Report.*—The exhibits are of a very fine quality and in very good condition.

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## 466. Serafino Burchi, Pisa, Italy.

## CONFECTIONERY.

*Report.*—A very fine assortment of candies and ornamental sugar flowers; all of very good quality and in very good condition.

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## 467. Francesco Gaetani Tamburini, Monsampolo del Tronto, Italy.

## FIGS AND NOUGAT.

*Report.*—Made of sugar, figs, and other alimentary products; very fine taste and in very good condition.

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## 468. Du Vivier &amp; Co., New York, N. Y., U. S.

## ASSORTED PICKLES.

*Report.*—Commended for—1. Excellent flavor.  
2. Carefulness in the preparation and the putting up.

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## 469. W. Underwood &amp; Co., Boston, Mass., U. S.

## FAMILY PICKLES; WALNUT CATSUPS.

*Report.*—Commended for—1. Good taste.  
2. Careful preparation.

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## 470. Skilton, Foote, &amp; Co., Boston, Mass., U. S.

## BUNKER HILL PICKLES.

*Report.*—Commended for—1. Their remarkable cheapness.  
2. Good taste, the price being considered.

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## 471. Squire Dingee, Chicago, Ill., U. S.

## PICKLES AND SAUCES.

*Report.*—Commended for good pleasant flavor.

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## 472. E. T. Cowdrey &amp; Co., Boston, Mass., U. S.

## MIXED PICKLES, GHERKINS, CATSUPS.

*Report.*—Commended for good taste and cheapness.

## 473. Crosse &amp; Blackwell, London, England.

## PICKLES AND SAUCES.

*Report.*—Commended for the following reasons:

1. Most careful preparation.
  2. Excellent taste.
  3. Great variety.
- 

## 474. Canadian Meat and Produce Co., Sherbrooke, Quebec, Canada.

## PICKLES, SAUCES, AND SOUPS.

*Report.*—Commended for the following reasons:

1. Careful preparation.
  2. Very good taste.
  3. Variety.
- 

## 475. A. Bornibus, Paris, France.

## PICKLES AND MUSTARD.

*Report.*—Commended for the following reasons:

1. Their excellent taste.
  2. Their freshness.
  3. Their careful preparation.
- 

## 476. Agricultural Commission of the Province of Maranhão, Brazil.

## PICKLES, PEPPERS, PIMENTOS, PARMITOS.

*Report.*—Commended for the following reasons:

1. Tastefully and carefully put up.
  2. Well flavored.
- 

## 477. Leopoldina Rosa da Silva Canora, Pará, Brazil.

## MIXED PICKLES.

*Report.*—These pickles are put up with great taste, and have a good, strong flavor.

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## 478. Santos &amp; Ferreira, Rio de Janeiro, Brazil.

## PALMITO, MIXED PICKLES, PRESERVED BEETS.

*Report.*—Commended for—1. Tasteful appearance.

2. Good strong flavor.
- 

## 479. F. P. de Vasconcelos, Bahia, Brazil.

## ASSORTED CONSERVES AND PRESERVED PICKLES.

*Report.*—They are carefully preserved, have a strong, warm flavor, and look very fresh.

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## 480. Dr. Giacomo Josi Belucci, Modena, Italy.

## PRESERVED PICKLES.

*Report.*—Commended for the following reasons:

1. Carefully put up in tin cans.
2. Pleasant flavor.
3. Tastefully prepared.

## REPORTS ON AWARDS.

## 481. Wm. King, Brooklyn, N. Y., U. S.

KING'S SAUCE, ROYAL AND TABLE SAUCE.

*Report.*—Commended for—1. Their pleasant flavor.

2. Careful preparation.

## 482. John Annear &amp; Co., Philadelphia, Pa., U. S.

PENNSYLVANIA SAUCE.

*Report.*—Commended for—1. Very good taste.

2. Cheapness.

## 483. A. A. Smyth, Philadelphia, Pa., U. S.

TABLE SAUCE.

*Report.*—Commended for—1. Good taste.

2. Careful preparation.

## 484. Reckhow Preserving Co., Paterson, N. J., U. S.

SALAD CREAM, TOMATO CATSUP, CHOW-CHOW, AND PICKLES.

*Report.*—Commended for good taste and cheapness.

## 485. Stephen H. Provost, New York, N. Y., U. S.

SAUCES.

*Report.*—Commended for—1. Good taste.

2. Cheapness.

## 486. Goodal, Backhouse, &amp; Co., Leeds, England.

YORKSHIRE RELISH.

*Report.*—Commended for good taste and careful preparation.

## 487. Lea &amp; Perrins, Worcester, England.

WORCESTERSHIRE SAUCE.

*Report.*—Commended for the following reasons:

1. Excellent taste.

2. Very carefully prepared.

## 488. James Ball, London, England.

SAUCE (QUI HI SAUCE).

*Report.*—It has a very good flavor, and is put up with great care and neatness.

## 489. James Pratt, London, England.

SAUCE (PRATT'S NATIONAL SAUCE).

*Report.*—It is a good, well-flavored mixture, prepared with care.

## 490. Stringer &amp; Co., Melbourne, Victoria, Australia.

SAUCES, PICKLES, AND CURRY POWDERS.

*Report.*—A good collection of mixed pickles, sauces, catsups, curry powder, etc., that recommends itself by its great variety, as well as by the good flavor of the different articles and the care with which they are put up.

## 491. Edward Zorn, Oakleigh, Victoria, Australia.

## TOMATO SAUCE AND OAKLEIGH SAUCE.

*Report.*—The tomato sauce is of a beautiful color, like the fresh fruit, and both it and the Oakleigh sauce have an excellent taste.

## 492. Geo. Lyon, Beechworth, Victoria, Australia.

## SAUCE (BOGONG SAUCE).

*Report.*—Commended for the good, wholesome flavor of the Bogong sauce, and for careful preparation.

## 493. Henry Comfort, Cheltenham, Victoria, Australia.

## TOMATO SAUCE.

*Report.*—The tomato sauce is very carefully prepared, of a good color and excellent taste.

## 494. S. P. Hogg &amp; Co., Melbourne, Victoria, Australia.

## CURRY POWDER.

*Report.*—Commended for the following reasons: the delicious taste of the curry powder; the care with which it is put up.

## 495. J. H. Boreham, South Brisbane, Queensland, Australia.

## CHUTNEY AND TOMATO CATSUP SAUCES.

*Report.*—The Chutney and tomato catsups are very well prepared and very well flavored.

## 496. Naga-oka Zenpachi, Tokio, Japan.

## SAUCES.

*Report.*—The Shoyu sauce, to be used with meat and fish and for the purpose of flavoring gravies and soups, is excellent; the preparation is most careful, and it recommends itself strongly for its purity and flavor.

The Mirin sauce is very good for sweetening puddings, etc.

## 497. Joaquim Martinez, Pontevedra, Spain.

## TOMATO SAUCE AND SWEET PIMENTO.

*Report.*—They are carefully prepared, and have a good taste and color.

## 498. August Schweigert, Geneva, Switzerland.

## SAUCE (THEODOROS).

*Report.*—The Theodoros sauce is an excellent relish for meat, fish, and soups, and recommends itself by its freshness and original taste.

## 499. Walter Baker &amp; Co., Boston, Mass., U. S.

## COCOA AND CHOCOLATE.

*Report.*—A good collection of cocoa and chocolate.

## 500. Agapito Nieves, Albay, Philippine Islands.

## COCOA.

*Report.*—Of good condition and agreeable flavor.



## 501. Provincial Board of Batangas, Philippine Islands.

COCOA.

*Report.*—Commended for good condition and agreeable flavor.

## 502. Provincial Board of Antique, Philippine Islands.

COCOA.

*Report.*—Commended for good condition and agreeable flavor.

## 503. Portuguese Government, Island of S. Thome and Principe.

COCOA.

*Report.*—Very large cocoa beans, of remarkably fine flavor.

## 504. E. Menier, Paris, France.

CACAO.

*Report.*—The cacao is of the best quality, and perfectly prepared.

## 505. Government of Venezuela.

CACAO.

*Report.*—Twenty exhibitors of different qualities of cacao, universally acknowledged to be the best in the world.

## 506. Maria de J. Silva &amp; Sons, Rio de Janeiro, Brazil.

CACAO.

*Report.*—Very fine quality of cacao, particularly adapted to the Spanish taste.

## 507. Henry Maillard, New York, N. Y., U. S.

CHOCOLATE.

*Report.*—A fine collection of chocolate, manufactured with the best sorts of cocoa and sugar.

## 508. Stephen F. Whitman &amp; Son, Philadelphia, Pa., U. S.

CHOCOLATE.

*Report.*—A fine collection of chocolate, manufactured with the greatest care; delicious cocoa paste.

## 509. H. Runkel &amp; Co., Tompkinsville, Staten Island, N. Y., U. S.

CHOCOLATES.

*Report.*—A good collection of family chocolates, imperial French sweet chocolate, chocolate vanilla, chocolate vanilla double, chocolate triple, perfected chocolate.

## 510. J. S. Fry &amp; Sons, London and Bristol, England.

CHOCOLATE.

*Report.*—A fine collection of chocolate and bonbons. Commended for remarkable taste and cheapness; high standard.

## 511. E. Menier, London, England.

CHOCOLATE.

*Report.*—Commended for the following reasons: 1, very fine preparation; 2, remarkable cheapness.

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## 512. F. Langier &amp; Co., Kingston, Jamaica.

CHOCOLATE.

*Report.*—Commended for its good preparation.

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## 513. George Landrin, St. Petersburg, Russia.

CHOCOLATE AND BONBONS.

*Report.*—A fine collection, prepared with very great care; of good flavor, form, and freshness.

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## 514. E. Menier, Paris, France.

CHOCOLATE.

*Report.*—Remarkably fine preparation, high standard, cheapness, with excellence of quality.

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## 515. Lombart, Choisy-le-Roy, near Paris, France.

CHOCOLATE.

*Report.*—Chocolate carefully prepared with the best sorts of cacao and sugar.

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## 516. A. Joveneau, Tournai, Belgium.

CHOCOLATE.

*Report.*—Commended for quality and cheap prices.

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## 517. N. Delannoy, Tournai, Belgium.

CHOCOLATE AND BONBONS.

*Report.*—Very fine chocolate, made with the purest and best cocoas and sugar. High standard.

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## 518. Fullie Brothers, Caracas, Venezuela.

CHOCOLATE.

*Report.*—Of good quality, agreeable taste, and well manufactured.

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## 519. Luis Rus &amp; Co., Caracas, Venezuela.

CHOCOLATE.

*Report.*—Of very good quality, fine flavor, and prepared from the best Caracas cacao.

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## 520. José Maria Blanco, Santiago, Coruña, Spain.

CHOCOLATE.

*Report.*—Chocolate preserved in small tablets with crystallized sugar; of good taste and cheap.

## 521. Widow of L. Dubois, Murcia, Spain.

CHOCOLATE.

*Report.*—A very good chocolate, well prepared and preserved.

## 522. Lopez &amp; Vasquez, Madrid, Spain.

CHOCOLATE.

*Report.*—A remarkable collection of very cheap chocolate; fine preparation.

## 523. Francisco Leal, Coruña, Spain.

CHOCOLATE.

*Report.*—Of good quality and good preservation; very nice taste.

## 524. Antonio Maria Fernandez, Oviedo, Spain.

CHOCOLATE.

*Report.*—Good chocolate; remarkable quality, with a wonderful cheapness.

## 525. Cuevas &amp; Garcia, Valladolid, Spain.

CHOCOLATE.

*Report.*—Chocolate made expressly with cacao and sugar; fine taste; wonderful cheapness.

## 526. Enrique Calvo de Castro, Ferrol, Spain.

CHOCOLATE.

*Report.*—A remarkable quality of chocolate; in good preservation; cheap.

## 527. Widow of Blas Alonso, Leon, Spain.

CHOCOLATE.

*Report.*—A very good chocolate; good preparation; fresh taste.

## 528. Olallo Lazaro, Talavera, Spain.

CHOCOLATE.

*Report.*—A careful preparation; of very fine taste.

## 529. Salustiano Mariño Escarda, Benavente, Zamora, Spain.

CHOCOLATE.

*Report.*—A careful preparation. Chocolate very well preserved, with a fresh taste.

## 530. Pedro Antonio Alonso, Mansilla de las Mulas, Leon, Spain.

CHOCOLATE.

*Report.*—Of good quality; nice fresh taste; very cheap.

## 531. Maximo Alonso de Prado, Leon, Spain.

CHOCOLATE.

*Report.*—A collection of several sorts of chocolate, of very fine taste, careful preparation, and wonderful cheapness.

## 532. Manuel Garcia, Lerida, Spain.

CHOCOLATE.

*Report.*—A good fabrication; commended for its sweetness.

## 533. Matias Lopez, Madrid, Spain.

CHOCOLATE.

*Report.*—A careful preparation with rich cacaos and sugar; of remarkable cheapness.

## 534. Francisco Enciso de Ruiz, Munilla, Spain.

CHOCOLATE.

*Report.*—Very good chocolate, of remarkable cheapness.

## 535. Benito Acebal y Menendez, Oviedo, Spain.

CHOCOLATE.

*Report.*—Chocolate expressly made with the richest cacaos and sugar; a careful preparation.

## 536. Francisco Hernandez &amp; Brothers, Lugo, Spain.

CHOCOLATE.

*Report.*—Chocolate carefully prepared; in good preservation; of remarkable cheapness.

## 537. Juan Macaya, Reus, Spain.

CHOCOLATE.

*Report.*—A good preparation; good quality; remarkable cheapness.

## 538. Tadeo Ortiz &amp; Sons, Palencia, Spain.

CHOCOLATE.

*Report.*—Pure chocolate, expressly made with the best cacaos and sugar; a very good preparation; nice taste.

## 539. José Maria Iriarte, Havana, Cuba.

CHOCOLATE.

*Report.*—A careful preparation; only made with the best sorts of cacao and sugar, and keeping a very fresh taste.

## 540. Domingo Ascaso, Zaragoza, Spain.

CHOCOLATE.

*Report.*—Very careful fabrication; remarkably fine taste.

## 541. Colonial Company (Meric &amp; Co.), Madrid, Spain.

CHOCOLATE AND BONBONS.

*Report.*—A perfect preparation, only made with the best sort of cacao and sugar; good preservation, and remarkably fine taste, according to the quality of each kind of chocolate; high standard.

**542. Ribera Guarner & Brothers, Alicante, Spain.**

## CHOCOLATE.

*Report.*—Chocolate, well manufactured from good sorts of cacao, and with aroma to suit the taste of the country where it is made.

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**543. Plana & Co., Havana, Cuba.**

## CHOCOLATE.

*Report.*—Chocolate, remarkably prepared, with the best sorts of cacao and sugar; a good preservation.

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**544. José Fernandez, Matanzas, Cuba.**

## CHOCOLATE.

*Report.*—Very well manufactured, and well preserved, with a fresh taste.

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**545. Monros, Prieto, & Co., Havana, Cuba.**

## CHOCOLATE.

*Report.*—A fine collection of chocolate, very well prepared with the best cacao on sugar only; nice and fresh taste.

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**546. Ferreira & Co., Lisbon, Portugal.**

## CHOCOLATE.

*Report.*—A very good collection; manufactured by steam.

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**547. Guilhermina Rosa de Carvalho, Oporto, Portugal.**

## CHOCOLATE.

*Report.*—Two qualities; simple and sweet; good product.

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**548. Ignacio H. Ferrer, City of Mexico, Mexico.**

## CHOCOLATE.

*Report.*—The quality and the flavor are good.

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**549. Commission for the Province of Pará, Brazil.**

## CHOCOLATE AND CACAO.

*Report.*—Two kinds of cacao, of very fine quality.

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**550. Liborio, Lino, & Ferreira, São Paulo, Brazil.**

## CHOCOLATE.

*Report.*—Excellent quality of chocolate, very carefully prepared.

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**551. Luiz Francisco de Pinho, Rio de Janeiro, Brazil.**

## CHOCOLATE.

*Report.*—Three kinds of chocolate,—in cakes, powder, and *homœopathics*; delicious and remarkably cheap.

**552. Stollwerk Brothers, Cologne-on-the Rhine, Germany.**

CHOCOLATE.

*Report.*—Commended for perfect granulation, and good quality and taste, derived from fine cacao.

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**553. Grootes Brothers, Westzann, Netherlands.**

CHOCOLATE.

*Report.*—Very fine; first quality of manufacturing; first quality of taste.

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**554. A. Driessen, Rotterdam, Netherlands.**

CHOCOLATE.

*Report.*—The chocolate was highly admired for its good manufacture; the taste was fine. It belongs to the best productions of that kind.

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**555. De Bont & Leijten, Amsterdam, Netherlands.**

CHOCOLATE AND SUGAR BONBONS.

*Report.*—The chocolate of this manufactory was highly admired; also the sugar bonbons for their taste and excellent quality, besides for the artistic figures and admirably finished compositions.

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**556. Ph. Suchard, Neuchâtel, Switzerland.**

CHOCOLATE.

*Report.*—A fine collection of chocolate.

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**557. Central Maté Export Co., Porto Allegre, Brazil.**

MATÉ.

*Report.*—Well selected and prepared and carefully put up.

---

**558. J. Pereira Correia, Antonina, Paraná, Brazil.**

MATÉ.

*Report.*—Native tea, strongly recommended for people whose nerves are affected by Chinese or Japanese tea.

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**559. Luiz Manoel Agnez, Paraná, Brazil.**

MATÉ.

*Report.*—The maté, or native tea, is well prepared, and recommends itself strongly for its delicious flavor, its freshness and wholesomeness.

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**560. Gaetano Jose Munhoz, Paraná, Brazil.**

MATÉ.

*Report.*—Excellent natural tea, of pleasant flavor and wonderful cheapness.

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**561. Vicente Ferreira da Luz, Paraná, Brazil.**

MATÉ.

*Report.*—The maté is a native plant, with which a most refreshing drink is made, approaching the flavor of tea. It is preferable to tea for all nervous organizations, and its use is safer for them.

**562. Joaquim Ventura d'Almeida Torres, Paraná, Brazil.****MATÉ.**

*Report.*—This maté is well selected and carefully put up.

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**563. Minobe Chinbeye, Kiyoto, Japan.****TEA.**

*Report.*—Very fine quality of tea, prepared without any chemical ingredients; it derives its superior qualities from the particularly favorable composition of the soil where it grows in the province of Yamashiro.

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**564. First Japanese Manufacturing & Trading Co., Tokio, Japan.****COLLECTION OF TEAS.**

*Report.*—These teas recommend themselves by the delicacy of their taste, their aroma, and by the fact that no chemical ingredient enters into their preparation.

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**565. Noroka Taizo, Tojikiken, Japan.****TEA.**

*Report.*—Pure tea, of a delicate flavor, in the composition of which enter no chemical ingredients.

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**566. Marunaka Magohei, Kanazawa, Japan.****TEA.**

*Report.*—Two distinct kinds of natural tea, without any chemical preparation or coloring, and of a fine and delicate flavor.

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**567. The Imperial Board of Agriculture, Industry, and Commerce, Tokio, Japan.****TEA.**

*Report.*—A large collection of fine tea, of superior aroma and free from all chemical preparations.

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**568. Kambayshi, Sansho, & Sanniu, Uji, Yamashiro, Japan.****TEA.**

*Report.*—Very fine quality of tea, prepared without any chemical ingredients, and grown upon a soil which is more favorable for that culture than any other in Japan.

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**569. Imperial Maritime Customs, China.****TEA.**

*Report.*—A large collection of black teas, Conger, Oolong, Pekoe, Caper, Pouchong, and Souchong; green teas, Young Hyson, Hyson, Twankay, Gunpowder, and Imperial, exported from Hankow, Kinkiang, Shanghai, Ningpo, Foochow, Swatow, and Canton; some of them with a very delicate flavor, and almost all at reasonable prices.

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**570. Rocha Leão & Co., São Paulo, Fazenda de Murumby, Brazil.****TEA.**

*Report.*—Green tea; well prepared; good and delicate flavor.

## 571. Fazenda de Thezoureiro, Minas Geraes, Brazil.

## TEA.

*Report.*—Three kinds of green tea, of very good quality; well prepared, delicate, and of pleasant flavor.

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## 572. Councillor J. da S. Carrão, São Paulo, Brazil.

## GREEN TEA.

*Report.*—A good quality of green tea, well prepared.

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## 573. Jose Luis Martins, Rio de Janeiro, Brazil.

## TEA.

*Report.*—Two kinds of green tea, well prepared and of good flavor.

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## 574. Arouche, São Paulo, Brazil.

## TEA.

*Report.*—This tea (called the perlé) is of excellent quality and perfectly prepared.

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## 575. Francisco L. de M. Russo, São Paulo, Brazil.

## TEA.

*Report.*—Very good green tea, with an excellent flavor.

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## 576. J. R. Xavier, São Paulo, Brazil.

## TEA.

*Report.*—A good quality of pleasantly flavored green tea.

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## 577. T. &amp; H. Smith &amp; Co., Edinburgh, Scotland.

## ESSENCE OF COFFEE AND ESSENCE OF FRUIT.

*Report.*—The essence of coffee is very good, cheap, and portable. There is a very fine and varied collection of essences of fruit, which all retain their characteristic aroma to a wonderful degree.

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## 578. John McLean, Jamaica.

## COFFEE.

*Report.*—Commended for coffee of the first quality. The grains are agreeably aromatic and very well dried.

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## 579. James Harrison, Jamaica.

## COFFEE.

*Report.*—Commended for the color and aroma, and for the great size of the grains.

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## 580. John Davidson, Jamaica.

## COFFEE.

*Report.*—Commended for the color and aroma, and for the great size of the grains.



## 581. M. M. Lascelles, Jamaica.

## COFFEE.

*Report.*—Commended for the color and aroma, and for the great and regular size of the grains.

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## 582. Ernest Elliwitt, Jamaica.

## COFFEE.

*Report.*—Commended for the color and aroma, and for the great and regular size of the grains.

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## 583. Dr. Stephens, Jamaica.

## COFFEE.

*Report.*—The color is good; the grains very small and flat.

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## 584. Francis Chalmer, Jamaica.

## COFFEE.

*Report.*—Commended for the color and aroma, and for the great size of the grains.

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## 585. Mr. Macclaverty, Jamaica.

## COFFEE.

*Report.*—Commended for the color and aroma, and for the great size of the grains.

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## 586. The Government of Jamaica.

## COFFEE NERAMICA AND COFFEE-LEAF TEA.

*Report.*—The coffee neramica is passable as a substitute of the true coffee. The coffee-leaf tea is passable.

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## 587. F. Harman, Riga, Russia.

## COFFEE OF CHICORY.

*Report.*—A good product.

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## 588. Bruno Hofmark, St. Petersburg, Russia.

## COFFEE OF CHICORY.

*Report.*—A good product.

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## 589. Pykhof Brothers, Rostov, Yaroslav, Russia.

## COFFEE OF CHICORY.

*Report.*—This product is good.

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## 590. Starr &amp; Co., Riga, Russia.

## COFFEE OF CHICORY.

*Report.*—The product is good, and the chicory of the best; completely soluble.

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## 591. Charles Vandendaele-Rigot, Quievrain, Belgium.

## COFFEE OF CHICORY.

*Report.*—Good preparation, and substitute of the natural coffee.

**592. Rodolphe Ameye-Berte, Ghent, Belgium.**

COFFEE OF CHICORY.

*Report.*—Good preparation and substitute of the natural coffee.

---

**593. Government of Venezuela.**

COFFEE.

*Report.*—Thirty-two exhibitors of very good coffee, beautiful color, aroma, and taste.

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**594. Colonial Co. of Madrid, Spain.**

GROUND COFFEE.

*Report.*—Pure ground coffee, of excellent taste and fruity aroma.

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**595. Ferrer & Ballester, Adjuntas, Porto Rico.**

COFFEE.

*Report.*—Of very good qualities.

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**596. Domingo Santoni, San German, Porto Rico.**

COFFEE.

*Report.*—Of very good quality.

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**597. Provincial Board of Batangas, Philippine Islands.**

COFFEE.

*Report.*—Commended for good flavor.

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**598. Angel Velarde, Cavite, Philippine Islands.**

COFFEE.

*Report.*—Commended for good flavor.

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**599. Provincial Board of Mindanao, Philippine Islands.**

COFFEE.

*Report.*—Commended for its good flavor.

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**600. Government of St. Thomé and Principe, Portugal.**

COFFEE.

*Report.*—A very good collection.

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**601. Government of Cape Verd, Portugal.**

COFFEE.

*Report.*—A very good collection; color and size are regular.

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**602. Government of Mozambique, Portugal.**

COFFEE.

*Report.*—A good collection.

## 603. Government of Macao, Portugal.

COFFEE.

*Report.*—A good collection \_\_\_\_\_

## 604. Government of Portuguese India.

COFFEE.

*Report.*—A good collection. \_\_\_\_\_

## 605. Government of Angola, Portugal.

COFFEE.

*Report.*—A good collection. \_\_\_\_\_

## 606. Cirilo Mingo, Cordoba, Mexico.

COFFEE.

*Report.*—A good product. \_\_\_\_\_

## 607. Santiago Villa, Cordoba, Mexico.

COFFEE.

*Report.*—Good products. \_\_\_\_\_

## 608. General Mariano Escobedo, Morelia, Mexico.

COFFEE.

*Report.*—Good products. \_\_\_\_\_

## 609. Cuastecomatan Co., Colima, Mexico.

COFFEE.

*Report.*—A good product. \_\_\_\_\_

## 610. Government of Vera Cruz, Mexico.

COFFEE.

*Report.*—A good product; of agreeable flavor. \_\_\_\_\_

## 611. Commission of the Province of Maranhão, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

## 612. Colony Leopoldina, Santa Catharina, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

## 613. Colony Alexandra, Paraná, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

## 614. Commission of the Province of Rio de Janeiro, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

**615. Colony Blumenau, Santa Catharina, Brazil.****COFFEE.***Report.*—Of very good quality.**616. Government of Brazil.****COFFEE.***Report.*—Of a very good quality.**617. Manoel A. Ayrosa, Rio de Janeiro, Brazil.****COFFEE.***Report.*—Of superior quality (extra); grains of regular size and color; rich in flavor.**618. Viscount of Jaguary, Rio de Janeiro, Brazil.****COFFEE.***Report.*—Of superior quality (extra); grains of regular size and color; rich in flavor.**619. José Assis Alver, Minas Geraes, Brazil.****COFFEE.***Report.*—Of superior quality (extra); grains of regular size and color; rich in flavor.**620. Baron of Bella Vista, São Paulo, Brazil.****COFFEE.***Report.*—Of superior quality (extra); grains of regular size and color; rich in flavor.**621. Augusto J. de M. Jordão, Rio de Janeiro, Brazil.****COFFEE.***Report.*—Of superior quality (extra); grains of regular size and color; rich in flavor.**622. José Manoel Freire, Rio de Janeiro, Brazil.****COFFEE.***Report.*—Of superior quality (extra); grains of regular size and color; rich in flavor.**623. José Pinto Tavares, Rio de Janeiro, Brazil.****COFFEE.***Report.*—Coffee of superior quality (extra); grains of regular size and color; rich in flavor.**624. Pedro Ramos Nogueira, São Paulo, Brazil.****COFFEE.***Report.*—Coffee of superior quality (extra); grains of regular size and color; rich in flavor.**625. Crysgno J. Fernandes, Bahia, Brazil.****COFFEE.***Report.*—Of very good quality.

## 626. Umbelino Costa, Bahia, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

## 627. Ernesto Krull, Bahia, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

## 628. Frederica Krull, Bahia, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

## 629. Viscountess of Rio Novo, Rio de Janeiro, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

## 630. Antonio Pompeo de Camargo, São Paulo, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

## 631. Antonio da Costa Pereira, Rio de Janeiro, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

## 632. Freire &amp; Brother, Rio de Janeiro, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

## 633. Maria Constança de Jesus Silva &amp; Sons, Rio de Janeiro, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

## 634. Lazzarini, Rio de Janeiro, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

## 635. Manoel de Freitas Lemos, Rio de Janeiro, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

## 636. Luiz Bornaud, Bahia, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

## 637. José Teixeira da Nobrega Nephew, São Paulo, Brazil.

COFFEE.

*Report.*—Of very good quality.

638. Joaquim F. d'Almeida Nogueira, São Paulo, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

639. Rodolpho Richter, Santa Catharina, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

640. Francisco Marcondes Machado, Rio de Janeiro, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

641. Francisco Pompeu do Amaral, São Paulo, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

642. Silverio Rodrigues Jordao, São Paulo, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

643. Baron of Araraquara, São Paulo, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

644. Pedro Maria da Costa, Minas Geraes, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

645. Rafael Tobias d'Aguiar, São Paulo, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

646. J. C. Carvalho, São Paulo, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

647. Viscount of Prados, Minas Geraes, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

648. F. F. Assis Fonseca, Minas Geraes, Brazil.

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_

649. Baron of Souza Gueiroz, São Paulo, Brazil.

COFFEE.

*Report.*—Of very good quality.

**650. Dr. Bernardo Gaviao, São Paulo, Brazil.**

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_**651. Domingo Gomez Jardim, Rio de Janeiro, Brazil.**

COFFEE.

*Report.*—Coffee of superior quality (extra); regular size and color of the grain: rich in flavor.  
\_\_\_\_\_**652. Manoel da Rocha Leão, Rio de Janeiro, Brazil.**

COFFEE.

*Report.*—Coffee of superior quality (extra); grain of regular size and color; rich in flavor.  
\_\_\_\_\_**653. Augusto Francisco de Lacerda, Bahia, Brazil.**

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_**654. Caetano J. Munhoz, Minas Geraes, Brazil.**

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_**655. Rafael Aguiar Paes de Barros, São Paulo, Brazil.**

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_**656. Commandeur José Verguiero, São Paulo, Brazil.**

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_**657. Agricultural Commission of Santa Catharina, Brazil.**

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_**658. Commission for the Province of Ceará, Brazil.**

COFFEE.

*Report.*—Of superior quality (extra); grains of regular size and color; rich in flavor.  
\_\_\_\_\_**659. F. N. Calmon Nogueira da Gama, Rio de Janeiro, Brazil.**

COFFEE.

*Report.*—Very good coffee, uniform in size, and of a very good aroma.  
\_\_\_\_\_**660. Antonio Cornelio dos Santos, Rio de Janeiro, Brazil.**

COFFEE.

*Report.*—Of superior quality (extra); grains of regular size and color; rich in flavor.

**661. J. Francisco de Paulo Souza, São Paulo, Brazil.**

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_**662. Luiz de Souza Breves, Minas Geraes, Brazil.**

COFFEE.

*Report.*—Of very superior quality. \_\_\_\_\_**663. Commandeur L. A. de S. Barros, São Paulo, Brazil.**

COFFEE.

*Report.*—Of very good quality. \_\_\_\_\_**664. Friburgo & Sons, Rio de Janeiro, Brazil.**

COFFEE.

*Report.*—Of superior quality (extra); grains of regular size and color; rich in flavor. \_\_\_\_\_**665. Councillor João da Silva Carrão, São Paulo, Brazil.**

COFFEE.

*Report.*—Of very good weight. \_\_\_\_\_**666. Baron of Juparano, Rio de Janeiro, Brazil.**

COFFEE.

*Report.*—Very good coffee, of remarkably good aroma. \_\_\_\_\_**667. Colonial Department of the Government of the Netherlands, The Hague, Netherlands.**

COFFEE AND TEA.

*Report.*—A rich and numerous collection of several varieties of very good coffee and tea; one of the best collections presented at the Exhibition. \_\_\_\_\_**668. Zurich-Surrogate Coffee Factory, Zurich, Switzerland.**

COLLECTION OF DIFFERENT COFFEES (IMITATION).

*Report.*—1. Fig coffee.

2. Tablet coffee.

3. Conserved coffee vanilla.

4. " " Rio de Janeiro.

5. " " Java.

The products are good, especially the fourth and the fifth. \_\_\_\_\_

**669. Pietro Pretta, Santiago, Chili.**

PREPARED COFFEE.

*Report.*—A good preparation of rich coffee taste. \_\_\_\_\_**670. Edward S. Morris & Co., Liberia, Africa, and Philadelphia, Pa., U. S.**

COFFEE, PALM OIL, INDIGO, PALM SOAP, IVORY, CAMWOOD, GINGER, COCOA, ARROWROOT, RAMIE, AND COFFEE-HULLING MACHINERY.

*Report.*—Commended for the following reasons:



1. The variety of articles exhibited.
2. The general good quality of the articles on exhibition, and especially the superior quality of the coffee and palm soap.

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671. J. S. Harbison, San Diego, Cal., U. S.

HONEY.

*Report.*—Commended for its full and excellent flavor and superior freshness and convenient form for marketing and use.

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672. C. H. Robinson, Nassau, Bahama Islands.

HONEY.

*Report.*—Commended for fine flavor and well-preserved quality of wild honey.

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673. Wm. McEvoy, Woodburn, Wentworth, Ontario, Canada.

HONEY.

*Report.*—Commended for its full aromatic flavor and well-preserved condition.

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674. P. A. E. Müller, Copenhagen, Denmark.

HONEY.

*Report.*—Commended for its good flavor and superior condition as to clearness and state of preservation.

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675. Dr. Fernando Bolet, Caracas, Venezuela.

HONEY.

*Report.*—Of rich and fine flavor, and the best quality.

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676. Ignacio de Cepeda, Huelva, Almonte, Spain.

HONEY.

*Report.*—Of very good taste and color.

---

677. José M. Alvarez Barrida, Huelva, Cartasya, Spain.

HONEY.

*Report.*—Of very good taste and good aroma.

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678. Eloy Lecanda Valluena de Duera, Valladolid, Spain.

HONEY.

*Report.*—Of good flavor and taste.

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679. Eustasio Herrariz, Cuenca, Spain.

HONEY.

*Report.*—Of very fine taste and agreeable aroma.

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680. Julian Cepeda, Yeste, Caceres, Spain.

HONEY.

*Report.*—Of very good taste and flavor.

681. Bernardo José de Olives, Ciudadela, Balearic Islands, Spain.

HONEY.

*Report.*—Of very good color and good taste.

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682. José Torralba, Cordenete, Cuenca, Spain.

HONEY.

*Report.*—Of very good color, taste, and flavor.

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683. Juan Corbalan, Saucelle, Salamanca, Spain.

HONEY.

*Report.*—Of very good color, flavor, and taste.

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684. Rosa Hernandez Sanchez, Hinojosa de Duero, Salamanca, Spain.

HONEY.

*Report.*—Of good aroma and taste.

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685. Gregorio de Domingo, Burgos, Spain.

HONEY.

*Report.*—Of very good color, taste, and flavor.

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686. José Palacios Roman, Seville, Spain.

HONEY.

*Report.*—Very good taste and flavor.

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687. Gregorio Domec Zuera, Zaragoza, Spain.

HONEY.

*Report.*—Good color, fine taste and aroma.

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688. José de Moura Pinheiro, Castello Branco, Portugal.

HONEY.

*Report.*—Commended for its excellent flavor and superior preservation.

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689. Antonia da Ca Azevedo Lemos, Varzeas, Vizeu, Portugal.

HONEY.

*Report.*—Commended for its superior flavor and well-preserved qualities.

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690. Matheus Rodriguez Tenorio, Alter da Chao, Portalegre, Portugal.

HONEY.

*Report.*—Commended for its superior flavor and well-preserved condition.

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691. Count of Atalaya, Quinta de S. Martha, Santarem, Portugal.

HONEY.

*Report.*—Commended for its extraordinary state of preservation and superior flavor.

**692. Antonino Candido Nunes, Elvas, Portalegre, Portugal.**

HONEY.

*Report.*—Commended for its superior flavor and well-preserved condition.**693. Candido Alberto Aguas Pinheiro, Monchique, Faro, Portugal.**

HONEY.

*Report.*—Commended for its superior flavor and preservation.**694. Diogo Lopez Montoya, Castello Branco, Portugal.**

HONEY.

*Report.*—Commended for its excellent flavor and well-preserved condition.**695. Manoel Vaz Preto Geraldès, Soura, Castello Branco, Portugal.**

HONEY.

*Report.*—Commended for its very fine flavor and well-preserved condition.**696. João Lopes Marcal, Evora, Portugal.**

HONEY.

*Report.*—Commended for its fine quality and well-preserved condition.**697. Jose Rodrigues Buraca, Grandola, Lisbon, Portugal.**

HONEY.

*Report.*—Commended for its high state of preservation and superior flavor.**698. Rebello Valente Allen, Campanha, Oporto, Portugal.**

HONEY.

*Report.*—Commended for its flavor and state of preservation.**699. Turkish Government.**

HONEY.

*Report.*—Commended for its excellent flavor.**700. Hussein Dede, Constantinople, Turkey.**

RILED BAHAR HONEY.

*Report.*—Commended for its excellent flavor and high state of preservation.**701. Domitilio Cortinez, San Juan, Argentine Republic.**

HONEY.

*Report.*—Commended for its fine flavor and perfect state of preservation.**702. Acclimatization & Agricultural Society of Palermo, Sicily, Italy.**

HONEY.

*Report.*—Commended for its good flavor and fine state of preservation.

## 703. Bartolucci Godolini Brothers, Rome, Italy.

## HONEY.

*Report.*—Commended for its good flavor and fine state of preservation.

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## 704. Ignaz Reibstein, Bübene, Bohemia, Austria.

## HONEY AND APIARY.

*Report.*—The honey is commended for its well-preserved condition of purity and flavor. The apiary is commended for the simplicity with which the comb can be removed and the bees preserved, for moderate cost, and easy access both for the bees and bee-keeper.

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## 705. Lauro Barros, Melipilla, Chili.

## HONEY AND WAX.

*Report.*—Commended for the fine quality of both wax and honey.

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## 706. Miss A. D. Etta Bloodgood, New York, N. Y., U. S.

## IMPERIAL SHEET WAX.

*Report.*—Commended for purity of color, tenacity, and delicacy of impression.

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## 707. Theodor Leonhard, Paterson, N. J., U. S.

## WAX.

*Report.*—Commended for its fine white color and tenacious quality.

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## 708. Joseph Fritsch, Carlstadt, N. J., U. S.

## WAX.

*Report.*—Commended for its superior refinement.

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## 709. G. H. Smithers, New York, N. Y., U. S.

## WAX.

*Report.*—Commended for its highly-refined state and susceptibility to impressions.

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## 710. Chas. Grant, Jamaica.

## WAX.

*Report.*—A large sample of nice bleached wax.

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## 711. P. E. Auvrey, Jamaica.

## WAX.

*Report.*—Samples of fine bleached wax.

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## 712. Dr. Fernando Bolet, Caracas, Venezuela.

## WAX.

*Report.*—The white wax is of very good quality and well purified.

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## 713. José Lorenzo Serrano, Zalamea la Real, Huelva, Spain.

## WAX.

*Report.*—Commended for its highly bleached and refined condition.

## 714. Vicente Antonio Perez, Talavera de la Reina, Toledo, Spain.

WAX.

*Report.*—A fine exhibit of common and refined wax.

## 715. Saturnino Estrado, Gumaca, Atimonan, Philippine Islands.

WAX.

*Report.*—A good collection of wax from common to a very refined and pure condition.

## 716. Vicente Narciso Rapozo, Castello de Vide, Portalegre, Portugal.

WAX.

*Report.*—Commended for its highly-refined condition.

## 717. Jose Baptista Vassallo, Torres Novas, Santarem, Portugal.

WAX.

*Report.*—Commended for its well-refined condition.

## 718. Jose Joaquin da Silva Magalhaes, Gaya, Oporto, Portugal.

WAX.

*Report.*—Commended for its tenacity and refined condition.

## 719. Antonio Jose Teixeira Mello, Lisbon, Portugal.

WAX.

*Report.*—A large collection of wax in its common, refined, and manufactured condition

## 720. Jose Maria Garcão, Elvas, Portalegre, Portugal.

WAX.

*Report.*—Commended for its highly purified and bleached condition.

## 721. State Government of Oaxaca, Mexico.

WAX.

*Report.*—Of good quality and finely bleached.

## 722. State Government of Morelos, Mexico.

WAX.

*Report.*—Of good quality and finely bleached.

## 723. State Government of Yucatan, Mexico.

VEGETABLE WAX.

*Report.*—Commended for its cheapness and value in making candles.

## 724. The Bey of Tunis.

WAX.

*Report.*—Commended for its highly-refined condition.

## 725. Riza Effendi, Constantinople, Turkey.

WAX.

*Report.*—Commended for its fine white color.

## 726. Commission for the Province of Rio Grande do Sul, Brazil.

WAX.

*Report.*—Samples of refined wax, of excellent quality.

## 727. Maria Miró, Paraná, Brazil.

WAX.

*Report.*—Commended for its purity and excellent refinement.

## 728. Commission for the Province of Ceará, Brazil.

VEGETABLE WAX.

*Report.*—Commended for its novelty and utility in artificial light.

## 729. Juan Tramon, Santa Fé, Argentine Republic.

WAX.

*Report.*—Commended for its excellent quality and refined condition.

## 730. José Otero, Buenos Ayres, Argentine Republic.

WAX.

*Report.*—Commended for its very tenacious quality and well-refined condition.

## 731. E. E. Visser, Amersfoort, Netherlands.

BEESWAX.

*Report.*—Of good quality.

## 732. National Board of Agriculture, Chili.

WAX.

*Report.*—Valuable sample of wax.

## 733. P. Lorillard &amp; Co., New York, N. Y., U. S.

SNUFF.

*Report.*—Scotch snuff, well manufactured, of good taste; Maccaboy snuff, well manufactured and of good perfume.

## 734. Stewart, Ralph, &amp; Co., Philadelphia, Pa., U. S.

SCOTCH SNUFF.

*Report.*—Very superior manufacture; put up in neat packages.

## 735. G. W. Gail &amp; Ax, Baltimore, Md., U. S.

SNUFF.

*Report.*—Scotch snuff; well manufactured, of good tobacco.

## 736. Juan F. Delgado, Caracas, Venezuela.

SNUFF.

*Report.*—A good fabrication; of good flavor.

## 737. Pedro Garriga, Ponce, Porto Rico.

RAPÉ SNUFF.

*Report.*—Very well manufactured; of good flavor and fine perfume.

## 738. Lisbon Tobacco Co., Lisbon, Portugal.

SNUFF.

*Report.*—A fine exhibit of various kinds of snuff; well granulated; of fine aroma and good flavor.

## 739. J. Paulo Cordeiro, Rio de Janeiro, Brazil.

SNUFF.

*Report.*—Well manufactured; good flavor; fine perfume; packed in very tasteful packages; highly commended.

## 740. Loltzbeck Brothers, Lahr, Germany.

SNUFF.

*Report.*—An exhibit of rapé snuff; well manufactured and of good perfume.

## 741. W. T. Blackwell &amp; Co., Durham, N. C., U. S.

GRANULATED SMOKING TOBACCO.

*Report.*—His exhibit of smoking tobacco is commended for its low price for the quality; suited for general consumption.

## 742. P. Lorillard &amp; Co., New York, N. Y., U. S.

TOBACCO IN ALL ITS FORMS (EXCEPTING CIGARS).

*Report.*—Commended for their exhibit of almost every class and grade of manufactured tobacco. Their goods are of unexceptionable quality and workmanship.

## 743. Samuel M. Bailey, Richmond, Va., U. S.

SWEET PLUG TOBACCO.

*Report.*—An exhibit of sweet plug tobacco, of first-rate stock and uniform quality.

## 744. Lawrence Lottier, Richmond, Va., U. S.

PLUG TOBACCO.

*Report.*—A display of black navy tobacco, which is of superior quality.

## 745. L. J. Grant &amp; Co., Richmond, Va., U. S.

DARK NAVY AND CAVENDISH TOBACCO.

*Report.*—Commended for their exhibit of dark navy and bright sweet cavendish, of excellent quality.

**746. Thomas C. Williams & Co., Richmond, Va., U. S.**

PLUG TOBACCO.

*Report.*—Commended for their collection of very bright and very fine plug tobacco for the Australian and Californian markets. Stock and manufacture of a very high grade.

**747. Edmund Bourgeois, New Orleans, La., U. S.**

PERIQUE TOBACCO AND CIGARETTES.

*Report.*—Commended for his exhibit of Perique tobacco, which is of the first quality of St. James Parish (Louisiana) Perique.

**748. Lovell & Buffington, Covington, Ky., U. S.**

FINE-CUT CHEWING TOBACCO.

*Report.*—Commended for their exhibit of fine-cut chewing tobacco; the brand "Fountain" is very superior.

**749. P. H. Mayo & Brother, Richmond, Va., U. S.**

DARK NAVY PLUG TOBACCO.

*Report.*—Commended for their collection of dark navy plug, beautifully manufactured, and noted for its great keeping qualities.

**750. Frishmuth Brother & Co., Philadelphia, Pa., U. S.**

FINE-CUT CHEWING AND SMOKING TOBACCO.

*Report.*—Commended for their fine exhibit of fine-cut chewing and smoking tobacco, made of Kentucky bright leaf, all of high grade.

**751. Salmon, Hancock, & Co., Richmond, Va., U. S.**

PLUG TOBACCO.

*Report.*—Commended for their good exhibit of very bright plug tobacco; stock all of North Carolina and Virginia growth, of superior quality.

**752. Harry C. Holbrook, Louisville, Ky., U. S.**

PLUG TOBACCO.

*Report.*—Commended for his two hundred varieties of excellently manufactured chewing tobacco, of every grade suited to the American market. We especially commend the beautiful exhibit.

**753. C. A. Jackson & Co., Petersburg, Va., U. S.**

PLUG TOBACCO.

*Report.*—Commended for their exhibit of the brand "Above All," sweet chewing tobacco, free from grit, and of permanent flavor and sweetening.

**754. John F. Allen & Co., Richmond, Va., U. S.**

CHEWING AND SMOKING TOBACCO AND CIGARETTES.

*Report.*—Commended for the excellent quality of their tobacco in nearly all its manufactured forms; in some of its forms unsurpassed for beauty and quality; cigarettes of beautiful finish and excellent quality, and a peculiar cigar; cigarettes of Havana tobacco, with paper binding and Havana leaf wrapper of fine quality.



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**755. Wm. S. Kimball & Co., Rochester, N. Y., U. S.**

FINE-CUT CHEWING, CUT CAVENDISH (VANITY FAIR) SMOKING TOBACCO, AND CIGARETTES.

*Report.*—Commended for their exhibit of extraordinarily well cut chewing tobacco, and their cigarettes of well-cut cavendish of excellent quality.

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**756. Turpin & Brothers, Richmond, Va., U. S.**

PLUG TOBACCO.

*Report.*—Their exhibit of black navy of medium grades is very good, and well manufactured.

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**757. Edward Holbrook, Louisville, Ky., U. S.**

PLUG TOBACCO.

*Report.*—Commended for his five hundred styles of chewing tobacco. In manufacture, excellence of stock, and tastefulness of package they are entitled to the highest commendation. The arrangement is the most beautiful in the Exhibition.

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**758. Collective Exhibit of West Virginia, U. S.**

LEAF TOBACCO.

*Report.*—Consisting of nine samples from New River Basin, and nine samples from Upper Ohio counties; all of fine texture, color, and quality.

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**759. Sorver, Cook, & Co., Philadelphia, Pa., U. S.**

REHANDLED LEAF TOBACCO.

*Report.*—Commended for their exhibit of rehandled tobacco in the leaf, which evinces a very high degree of skill in this department of tobacco manipulation.

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**760. W. F. Pragoff, Louisville, Ky., U. S.**

LEAF TOBACCO.

*Report.*—Commended for his fine collection of West Virginia bright and Kentucky shipery and strips; also Africans.

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**761. G. W. Gail & Ax, Baltimore, Md., U. S.**

SMOKING AND CHEWING TOBACCO.

*Report.*—Commended for their exhibit of smoking and fine-cut chewing tobacco, and for variety and range of prices of their manufactures.

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**762. F. W. Felgner & Son, Baltimore, Md., U. S.**

GRANULATED AND STRAIGHT CUT TOBACCO.

*Report.*—Their exhibit of granulated tobacco for miners' use is particularly commended for its cheapness.

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**763. John W. Carroll, Lynchburg, Va., U. S.**

GRANULATED SMOKING TOBACCO.

*Report.*—An exhibit of "Lone Jack" granulated smoking tobacco. This tobacco is perfectly granulated, made of the highest grade of Virginia bright leaf, and deserves a special commendation for this class as good as the highest quality.

**764. L. L. Armstead, Lynchburg, Va., U. S.**

## GRANULATED SMOKING TOBACCO.

*Report.*—An exhibit of finely granulated smoking tobacco, prepared from the best Virginia leaf, and beautifully manufactured.

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**765. W. H. Trowbridge, Danville, Va., U. S.**

## GRANULATED SMOKING TOBACCO.

*Report.*—His granulated brand of "Duck Island" smoking tobacco is of very superior quality.

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**766. F. S. Kinney, New York, N. Y., U. S.**

## STRAIGHT CUT SMOKING TOBACCO AND CIGARETTES.

*Report.*—A fine exhibit of tobacco and cigarettes; cigarettes very well made, and of best Perique, Virginia, and Turkish tobacco, packed in very beautiful boxes; tobacco well cut and of fine flavor.

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**767. Marburg Brothers, Baltimore, Md., U. S.**

## GRANULATED SMOKING TOBACCO.

*Report.*—Commended for their exhibit of granulated smoking tobacco, well granulated, of fine yellow color, and delicious flavor.

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**768. H. Wilkens & Co., Baltimore, Md., U. S.**

## CUT AND GRANULATED SMOKING TOBACCO.

*Report.*—The nine varieties of cut and granulated smoking tobacco exhibited are of excellent quality, and very handsomely manipulated and put up for consumption.

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**769. Soutar & Co., Jamaica.**

## LEAF TOBACCO AND CIGARS.

*Report.*—Leaf tobacco, in small bales, of good quality; cigars handsomely manufactured, and in great variety.

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**770. Thompson & Weitzmann, Jamaica.**

## LEAF TOBACCO.

*Report.*—Exceedingly well prepared, and of first quality; fine aroma.

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**771. Aso Shosho, Spira Kawa, Japan.**

## LEAF TOBACCO AND CIGARS.

*Report.*—Cigars, well made, of pure well-cured Japan tobacco.  
Leaf tobacco; very superior; bright yellow; well cured.

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**772. Local Government of Kago, Shimâ-Ken, Japan.**

## STRAIGHT CUT SMOKING TOBACCO.

*Report.*—Beautifully cut, similar to best Turkish; fine color; of peculiar flavor.

**773. Municipality of Osaka, Japan.**

STRAIGHT CUT SMOKING TOBACCO.

*Report.*—Remarkably fine cut, and of fine aroma.

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**774. "Imperial Maritime Customs," China.**

TOBACCO.

*Report.*—The collection of tobaccos exhibited is from the ports of Takow, Kinkiang, Swatow, Tamsin, Hankow, Foochow, and Canton, and shows an extensive cultivation and considerable variety of production of this important crop. The mahogany-colored leaf from Swatow is of very fine texture, well grown and cured, and of excellent qualities. This variety is peculiar in the great length and small breadth of the leaf, and the delicacy of the stems and fibre. Another variety exhibited is very striking for its extraordinarily light color, almost white, and its delicacy of texture. We found no manufactured product in good condition, owing to the great length of time it was at sea, and the primitive style of preparation it undergoes for use in the pipe.

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**775. Spanish Government, Madrid.**

TOBACCO.

*Report.*—Commended for their splendid collection of cigars, snuff, and cigarettes, made in their four large factories at Madrid, Seville, Valencia, and Alicante. These cigars are manufactured principally from Kentucky and Virginia leaf tobacco.

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**776. Diaz & Solis, Sabana de Palmar, Porto Rico.**

TOBACCO.

*Report.*—An excellent variety of finest and well-cured leaf tobacco.

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**777. José Rodriguez Fuentes, San Juan, Porto Rico.**

TOBACCO.

*Report.*—A good variety of leaf tobacco, and excellently manufactured cigars.

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**778. Juan B. Carmona, Sabana de Palmar, Porto Rico.**

TOBACCO.

*Report.*—A good variety of leaf tobacco, of small size, but of excellent quality.

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**779. Spanish Government, Manila, Philippine Islands.**

TOBACCO.

*Report.*—An excellent collection of leaf tobacco and cigars, grown and manufactured in the Philippine Islands; cigars very well made.

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**780. Agricultural Society Porvenir, Canary Islands.**

TOBACCO.

*Report.*—A good collection of leaf, cigars, and cut tobacco. It is only five years since tobacco has been cultivated.

**781. Cuban Commission, Havana, Cuba.**

## TOBACCO.

*Report.*—A splendid collection of leaf tobacco, from the best districts of the island.

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**782. Factory Lealdade, Oporto, Portugal.**

## CUT SMOKING TOBACCO, CIGARS, AND CIGARETTES.

*Report.*—An exhibit of well-made low-priced cigars.

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**783. Asker Bedros, Constantinople, Turkey.**

## TURKISH TOBACCO AND CIGARETTES.

*Report.*—Turkish tobacco perfectly cut by the Turkish hand machine from leaf very small and fine and air-cured. He exhibits ten qualities: the best, from Yealidge, known by the name of Cocoulou (aromatic); cigarettes perfectly made in all respects, and of beautiful taste and perfume. A manufacturer using only the very choicest grades.

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**784. Imperial Ottoman Government, Constantinople, Turkey.**

## TURKISH TOBACCO AND CIGARETTES.

*Report.*—Tobacco beautifully cut, and selected from the crops of Europe and Asiatic Turkey. Owing to the facilities possessed by the Government, they supply the people the best qualities at the most reasonable prices.

The first quality offered by the Government is the very best produced cigarettes, handsomely made and very cheap.

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**785. Francisco A. Colares, Moreira, Maranhão, Brazil.**

## BORBA TOBACCO.

*Report.*—An exhibit of Borba tobacco, very aromatic; possessing great preserving qualities; well manufactured.

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**786. Daniel da Rocha Ferreira, Minas Geraes, Brazil.**

## ROLLED TOBACCO.

*Report.*—An exhibit of rolled tobacco. From its strong Perique flavor it is especially adapted for cigarettes and smoking.

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**787. Pinto & Brothers, Bahia, Brazil.**

## LEAF AND ROLLED TOBACCO.

*Report.*—An exhibit of fine leaf tobacco and roll.

The leaf, a heavy dark brown, is well cured, and the rolls are well made.

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**788. J. C. da Silva Muricy, Paraná, Brazil.**

## ROLLED TOBACCO AND CIGARETTES.

*Report.*—An exhibit of rolled tobacco and cigarettes. The tobacco is of fair Brazilian quality. The cigarettes are put up in corn-husks, neatly arranged, and of good tobacco.

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**789. José Espindola da Veiga, Rio de Janeiro, Brazil.**

## ROLLED AND CUT TOBACCO.

*Report.*—An exhibit of rolled and cut tobacco, of high grade, of best Brazilian tobacco.

**790. Jose C. Furtado, Pará, Brazil.**

BORBA TOBACCO.

*Report.*—An exhibit of Borba tobacco, in large rolls, highly aromatic and strong; of fine quality; evidently of great keeping properties.

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**791. Commission of the Province of Paraná, Brazil.**

ROLLED AND CUT TOBACCO.

*Report.*—An exhibit of rolled and cut tobacco, thoroughly manufactured according to the Brazilian system, having for its object the retention of the narcotic properties of the plant.

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**792. Director of the Colony Mucury, Paraná, Brazil.**

ROLLED TOBACCO.

*Report.*—A fine collection of rolled tobacco, well cured.

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**793. Colony of Blumenau, Santa Catharina, Brazil.**

ROLLED TOBACCO.

*Report.*—Samples of the very strong tobacco of good quality peculiar to the district.

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**794. Commission of the Province of Santa Catharina, Brazil.**

ROLLED TOBACCO.

*Report.*—A fine collection of rolled and leaf tobacco, illustrating very satisfactorily this industry in the province.

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**795. Commission of the Province of Pará, Brazil.**

BORBA TOBACCO.

*Report.*—An exhibit of Borba tobacco, possessing all the peculiar qualities of that tobacco to a high degree.

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**796. Director of the Colony Santa Maria, Brazil.**

LEAF AND ROLLED TOBACCO.

*Report.*—An exhibit of leaf and rolled tobacco, of good Brazilian tobacco.

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**797. Souza Novaes & Co., Rio de Janeiro, Brazil.**

ROLL AND CUT SMOKING TOBACCO.

*Report.*—An exhibit of roll and cut smoking tobacco. Their goods are of commendable quality.

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**798. Provincial Commission of Catamarca, Argentine Republic.**

LEAF TOBACCO, GRANULATED TOBACCO, AND CIGARETTES.

*Report.*—Leaf tobacco, well cured, of good flavor; granulated tobacco, well manufactured.

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**799. Commissioners of Chaco Territory, Argentine Republic.**

LEAF TOBACCO.

*Report.*—Of good color and well cured.

**800. Provincial Commission of Entre Rios, Argentine Republic.**

LEAF TOBACCO.

*Report.*—Of a light good color, veins small.

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**801. Valentin Beñia & Co., Santa Fé, Argentine Republic.**

CUT SMOKING TOBACCO.

*Report.*—Well cut, and of good, sound, well-flavored tobacco.

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**802. Agricultural Society of the Province of Guelderland, Netherlands.**

LEAF TOBACCO.

*Report.*—Quality fair, and well cured.

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**803. Conrad Langard, Christiania, Norway.**

CUT SMOKING AND PLUG TOBACCO AND CIGARS.

*Report.*—Cut smoking, well manufactured; plug, beautifully put up, and well made of good tobacco; cigars, well made.

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**804. Gumpert Brothers, Philadelphia, Pa., U. S.**

CIGARS.

*Report.*—An exhibit of domestic cigars, made from Penn tobacco. Meritorious on account of their very low price for quality.

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**805. S. Jacoby & Co., New York, N. Y., U. S.**

CIGARS.

*Report.*—An exhibit of cigars made from American, Havana, and Manila tobacco; well made and of good flavor.

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**806. George Alces, New York, N. Y., U. S.**

CIGARS.

*Report.*—Commended for his exhibit of fifteen varieties of domestic cigars, made entirely of Penn tobacco; beautifully made and of unexceptionable stock; entitled to the highest commendation as a purely American product.

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**807. T. J. Dunn & Co., Philadelphia, Pa., U. S.**

CIGARS.

*Report.*—An exhibit of domestic cigars. We commend these cigars as made of sound tobacco and at a low price.

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**808. Consolidated Tobacco Co. of San Francisco, Cal., U. S.**

CIGARS, AND CUT SMOKING, LEAF, AND GRANULATED TOBACCO.

*Report.*—Commended for their exhibit of tobacco, shown in various forms, such as cigars, cut and granulated smoking. This company appears to have introduced the highest scientific improvements of the age in the manufacture of tobacco. Their products are highly meritorious.

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**809. McFall & Lawson, Key West, Fla., U. S.**

CIGARS.

*Report.*—Commended for their exhibit of American-made cigars from pure Havana tobacco; beautifully made and of fine flavor.

**810. Sanchez Haya & Co., New York, N. Y., U. S.**

## CIGARS.

*Report.*—Commended for their exhibit of American-made cigars from Havana tobacco. The cigars are very well made, and meet the requirements of a large demand for such goods.

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**811. V. Martinez Ybor & Co., Key West, Fla., U. S.**

## CIGARS.

*Report.*—Cigars of various sizes and qualities, thoroughly well made. Tobacco imported from Havana, of very fine quality, sound, well cured, and of excellent aroma.

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**812. Seidenberg & Co., Key West, Fla., U. S.**

## CIGARS.

*Report.*—Commended for their exhibit of American-made cigars from pure Havana tobacco. By actual tests of the most accomplished expert in the group of Judges, their cigars were found to be equal in manufacture and flavor to the best imported Havana cigars.

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**813. Kerbs & Spiess, New York, N. Y., U. S.**

## CIGARS.

*Report.*—An exhibit of cigars made from pure domestic tobacco; well made and of good flavor.

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**814. W. Schweigert, Sydney, New South Wales, Australia.**

## CIGARS.

*Report.*—Well manufactured of native tobacco; good quality for price.

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**815. S. Davis & Co., Montreal, Canada.**

## CIGARS.

*Report.*—Well made; fine workmanship; from Havana and American tobacco. For workmanship these cigars are equal to any on exhibition.

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**816. Kraft Brothers, St. Petersburg, Russia.**

## CIGARS.

*Report.*—Their cigars are very well made and of sound tobacco, and sold at very low prices for common consumption.

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**817. Mylnikof & Zazobrin, Irkootsk, Russia.**

## TURKISH, RUSSIAN, AND SIBERIAN TOBACCO AND CIGARETTES.

*Report.*—A fine exhibit of tobacco and cigarettes,—forty-four varieties of cigarettes and fourteen varieties of tobacco.

The tobacco is well cut and of good perfume. The cigarettes with tubes are perfectly made, and of the choicest Turkish tobacco.

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**818. Asmolof & Co., Rostov-on-the-Don, Russia.**

## TURKISH AND RUSSIAN TOBACCO AND CIGARETTES.

*Report.*—An exhibit of cigarettes, well made and of good perfume.

**819. S. Dooroontcha, Poltava, Krementchoog, Russia.**

CIGARETTES AND TOBACCO.

*Report.*—An exhibit of cigarettes made from Turkish tobacco, imported, and also grown in Russia from Turkish seed. The cigarettes are very well made. The tobacco is of fine color and fine aroma.

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**820. Saatchi & Mangoobi, St. Petersburg, Russia.**

CIGARETTES AND TURKISH AND RUSSIAN TOBACCO.

*Report.*—An exhibit of Turkish and Russian tobacco and cigarettes. The cigarettes are beautifully made and of the finest tobacco. The tobacco is handsomely cut and well cured.

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**821. M. Dooroontcha, Poltava, Russia.**

CIGARETTES AND TOBACCO.

*Report.*—An exhibit of cigarettes, eighteen varieties, beautifully made from well-cut Turkish tobacco. Those of large size are particularly fine in make and flavor.

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**822. Jas. Kooshnaref, Rostov-on-the Don, Russia.**

CIGARETTES AND RUSSIAN AND TURKISH TOBACCO.

*Report.*—Well cut and of good perfume.

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**823. La Ferme Tobacco Co., St. Petersburg, Russia.**

TURKISH AND RUSSIAN TOBACCO AND CIGARETTES.

*Report.*—A fine exhibit of seventy-two varieties of cigarettes made of the purest Turkish tobacco; exquisitely made, and of very fine aroma.

Twenty varieties of tobacco; some of very fine grade.

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**824. Petrof Brothers, St. Petersburg, Russia.**

CIGARETTES AND CUT SMOKING TOBACCO.

*Report.*—The cut tobacco (Turkish imported) is well cured, well cut, and of excellent aroma. The cigarettes are well made, of strong tobacco.

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**825. Kishigawa Sai-ichiro, Hizen, Nagasaki, Japan.**

CIGARS.

*Report.*—Well made, from pure Japan tobacco.

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**826. Luis Marin del Coral, La Laguna, Canary Islands.**

CIGARS.

*Report.*—Cigars, well made; tobacco of fair quality.

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**827. Enrique Tolosa & Brother, Havana, Cuba.**

CIGARS.

*Report.*—Commended for his magnificent collection of cigars, beautifully manufactured.



**828. Ramon Allones, Havana, Cuba.**

## CIGARS.

*Report.*—The cigars admirably well made and of several varieties. The tobacco is of the finest quality of Cuban growth, perfectly sound and of exquisite aroma.

---

**829. Julian Alvarez, Havana, Cuba.**

## CIGARS.

*Report.*—A superior manufacture of cigars, put up in the finest boxes, with perhaps one exception, in the Exhibition. The quality of the tobacco is very superior.

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**830. Celestino Asay, Havana, Cuba.**

## CIGARS.

*Report.*—Commended for his special cigars, made of cut tobacco rolled in paper with a telescopic end; very ingenious and good.

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**831. Valle Suarez & Co., Havana, Cuba.**

## CIGARS.

*Report.*—A very good collection of excellent cigars, beautifully manufactured. Some of the brands equal to the best in the Exhibition.

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**832. Juan Bernabé Romero, Havana, Cuba.**

## CIGARS.

*Report.*—Commended for his excellent collection of splendidly manufactured cigars. The packages are of beautiful design, corresponding to the goods.

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**833. Diaz Bauces & Co., Havana, Cuba.**

## CIGARS.

*Report.*—A good collection of well-manufactured cigars.

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**834. José Geener, Havana, Cuba.**

## CIGARS.

*Report.*—A great variety of leaf and beautifully manufactured cigars. We especially commend the brand "La Escepcion" as perfect.

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**835. José Partagas, Havana, Cuba.**

## CIGARS.

*Report.*—Sixteen varieties of excellently made cigars, from the best leaf tobacco; for purity of the tobacco, beauty and neatness of finish, unsurpassed.

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**836. Bock & Co., Havana, Cuba.**

## CIGARS.

*Report.*—Cigars in great variety, and of the very finest quality. The packages are as tasteful as it is possible to make them. No goods in the Exhibition superior to these.

**837. Fernando Arrigunaga, Havana, Cuba.**

## CIGARS.

*Report.*—A great variety of very well made cigars. Fifteen varieties, all of the finest quality; and tobacco of the highest grade.

**838. Miguel Jane, Havana, Cuba.**

## CIGARS.

*Report.*—Well made; fine tobacco; good aroma; nice taste.

**839. Camino Cuesta & Co., Havana, Cuba.**

## TOBACCO AND CIGARETTES.

*Report.*—A great variety of cigarettes and cut tobacco for pipes, of excellent manufacture. We especially commend the telescopic cigarettes, and the curly-cut smoking tobacco.

**840. The Lisbon Tobacco Co., Lisbon, Portugal.**

## CIGARS, CIGARETTES, CUT AND SMOKING TOBACCO.

*Report.*—A large exhibit of cigars, made of good tobacco, and at low prices. The goods exhibited are of commendable quality.

**841. Miguel Augusto da Fonseca & Cardozo, Oporto, Portugal.**

## CIGARS, CIGARETTES, AND SMOKING TOBACCO.

*Report.*—Commended for their low-priced cigars, and for their exhibit of cut smoking, of Perique qualities.

**842. Balza & Brothers, Vera Cruz, Mexico.**

## CIGARS AND CIGARETTES.

*Report.*—The cigars are remarkably and handsomely made. The tobacco is of good body and very fine aroma, and in all respects highly meritorious.

**843. Anastasio Ortiz, City of Mexico, Mexico.**

## CIGARS.

*Report.*—The cigars are all well made and beautifully put up. The "Tot" has a peculiar and a very pleasant and agreeable aroma.

**844. Tomas S. Gardida, City of Mexico, Mexico.**

## CIGARS AND CIGARETTES.

*Report.*—They are well made, of excellent quality, and in great variety.

**845. Madrazo & Co., Vera Cruz, Mexico.**

## CIGARS AND CIGARETTES.

*Report.*—Their cigars, of Mexican-grown tobacco, are remarkably well made, and of excellent quality, ranking among the higher grades in the Exhibition. Their cigarettes are beautifully made, and of very fine quality, and remarkably cheap.

**846. The Hospital of Puebla, Mexico.**

CIGARETTES.

*Report.*—These cigarettes are well made, and highly creditable to the inmates of the hospital, poor boys, who perform all the labor.

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**847. Caravopulo Brothers, Cairo, Egypt.**

CIGARETTES.

*Report.*—Well made from fine quality of imported Turkish tobacco,

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**848. G. A. Schnorbusch, Bahia, Brazil.**

CIGARS.

*Report.*—Well made, of fine shape, and in great variety, and of the very best Brazilian tobacco.

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**849. J. F. Simas, Bahia, Brazil.**

CIGARS.

*Report.*—Well made, and of good Brazilian tobacco; low in price for quality.

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**850. Cerqueira & Co., Bahia, Brazil.**

CIGARS, CIGARETTES, AND CUT SMOKING TOBACCO.

*Report.*—Cigars, well made from pure Bahia tobacco; tobacco well cut from the leaf; cigarettes, well made, wrapped in corn-husks.

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**851. R. Cortina, Bahia, Brazil.**

CIGARS.

*Report.*—Well made; of great variety; packed in very tasteful boxes.

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**852. Souza Novaes & Co., Rio de Janeiro, Brazil.**

CIGARETTES.

*Report.*—Well made; handsomely put up in packages, and offered at low prices.

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**853. M. Mendez de Andés, Buenos Ayres, Argentine Republic.**

CIGARETTES.

*Report.*—Carefully manufactured from native tobacco.

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**854. Antonio Lago & Son, Buenos Ayres, Argentine Republic.**

CIGARETTES.

*Report.*—Well made from domestic tobacco; of good aroma and flavor; the paper used is made from rice.

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**855. P. J. Landfried, Rauenberg, Germany.**

CIGARS.

*Report.*—Well made in many varieties, from pure German tobacco; remarkable for their cheapness.

## 856. John B. Noll, Giessen, Germany.

## CIGARS.

*Report.*—A fine exhibit of cigars of domestic, Brazil, Sumatra, and Havana tobacco; thoroughly well made, and of superior tobacco.

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## 857. August Gaus, Baden-Baden, Germany.

## CIGARETTES.

*Report.*—Beautifully made, from fine Turkish and Greek tobacco; flavor delicious.

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## 858. Louis Groskopf, Königsberg, Germany.

## CIGARETTES.

*Report.*—Well made, with Turkish fillers wrapped with Havana tobacco; a new manufacture; novel and beautiful.

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## 859. C. G. Van der Post, Gouda, Netherlands.

## CIGARS.

*Report.*—These cigars, from Havana, Java, and domestic tobacco, are very well made and very cheap.

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## 860. Bleckmann Brothers, Arnheim, Netherlands.

## CIGARS.

*Report.*—Cigars in considerable variety; well made, of sound tobacco, and at very reasonable prices.

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## 861. Mignot &amp; De Block, Eindhoven, Netherlands.

## CIGARS.

*Report.*—Well made, of good, sound tobacco.

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## 862. Van der Jagt &amp; François, Utrecht, Netherlands.

## CIGARS.

*Report.*—These cigars, made of Havana, Java, and domestic tobacco, are very cheap, of good, sound tobacco, and very meritorious for the price.

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## 863. J. Kottmann, Solothurn, Switzerland.

## CIGARS.

*Report.*—Very well made, of good, sound tobacco; remarkable for their cheapness.

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## 864. E. Classen &amp; Co., Santiago, Chili.

## CIGARS, CIGARETTES, AND SMOKING TOBACCO.

*Report.*—Cigars made from purely Chilian tobacco; well manufactured. Their leaf tobacco is very fine, resembling Havana tobacco. This exhibitor is both planter and manufacturer.

865. **E. C. Hazard & Co., New York, N. Y., U. S.**

## PRESERVED EXTRACTS.

*Report.*—Commended for a very good non-alcoholic beverage, extracted from malt and hops, called "Malthoptonique."

866. **Lewis Hurd, Kewanee, Ill., U. S.**

## FRUIT HONEY.

*Report.*—For good fruit honey, made from apples.

867. **Gordon & Dilworth, New York, N. Y., U. S.**

## PRESERVED EXTRACTS.

*Report.*—A variety of jellies, of which the quince, crab-apple, lemon, and wine jelly were excellent, and the blackberry, raspberry, orange, and grape were very good.

868. **E. T. Cowdrey & Co., Boston, Mass., U. S.**

## PRESERVED EXTRACTS.

*Report.*—Commended for the good quality of their canned soups, especially a very good tomato soup; and the excellence of a variety of fruit jellies.

869. **Warner, Rhodes, & Co., West Jersey Packing Co., Philadelphia, Pa., U. S.**

## PRESERVED EXTRACTS.

*Report.*—Commended for the good quality of their quince jelly.

870. **John G. Borden, Brewsters, N. Y., U. S.**

## PRESERVED EXTRACTS.

*Report.*—Commended for the good quality of their extract of beef.

871. **Kemp, Day, & Co., New York, N. Y., U. S.**

## FRUIT JELLIES.

*Report.*—A variety of fruit jellies, of which the currant, raspberry, and orange were excellent, and the apple, lemon, and peach very good.

872. **New York Hop Extract Co. (W. A. Lawrence, Superintendent), New York, N. Y., U. S.**

## HOP EXTRACT.

*Report.*—An extract of hops, of considerable merit as an endeavor at utilizing hops, which deserves encouragement.

873. **W. K. Lewis & Brothers, Boston, Mass., U. S.**

## SOUP AND BOUILLI.

*Report.*—A good article of soup and bouilli canned.

874. **Edward M. Bagot, Adelaide, South Australia, Australia.**

## DRY EXTRACT OF MEAT.

*Report.*—Commended for the following reasons:

1. Very good flavor.
2. Compactness.
3. Good preservation.

## 875. John Petrof, St. Petersburg, Russia.

## EXTRACT OF CRANBERRIES.

*Report.*—This extract recommends itself strongly for its freshness and good taste as well as for its medical properties.

---

## 876. Dr. Ubatuba, Rio Grande do Sul, Brazil.

## EXTRACT OF MEAT.

*Report.*—Commended for the following reasons:

1. It retains fully, in a concentrated form, the special flavor of the kind of meat from which it is made.
  2. Its convenience in making soups and meat teas.
- 

## 877. Commission of the Province of Amazonas, Brazil.

## EXTRACT OF NEW-MOWN HAY AND PRINCIPAL CONSTITUENT OF THE TONKA BEAN.

*Report.*—Of delicious flavor,—a very good product.

---

## 878. Ed. Loeffund, Stuttgart, Germany.

## EXTRACT OF MALT.

*Report.*—Among all the preparations of malt, this has most fully met the requirements claimed for this most valuable agent.

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## 879. B. Holmes, Fort Atkinson, Wis., U. S.

## BUTTER.

*Report.*—The best package of butter of from twenty to thirty pounds of creamery make.

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## 880. Stewart &amp; Mellen, Manchester, Iowa, U. S.

## BUTTER.

*Report.*—Commended for the best samples of two hundred pounds and thirty-five pounds respectively, made at Newberry factory, and for samples from Edgewood and Hebron factories.

---

## 881. S. Farille, Lake Mills, Wis., U. S.

## BUTTER.

*Report.*—A sample of butter, of fine quality and flavor.

---

## 882. Eastburn Reeder, New Hope, Pa., U. S.

## BUTTER.

*Report.*—The best sample of dairy butter of from ten to twenty pounds.

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## 883. J. J. Smith &amp; Sons, Tomah, Wis., U. S.

## BUTTER.

*Report.*—A fine sample of butter of creamery make.

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## 884. P. H. Burchard, Grant Park, Ill., U. S.

## BUTTER.

*Report.*—A tub of meritorious butter.

## 885. E. J. Cripps, Columbus, Wis., U. S.

## BUTTER.

*Report.*—A good sample of butter, in pound prints, well preserved in brine, in the Adams package.

## 886. R. S. Houston, Kenosha, Wis., U. S.

## BUTTER.

*Report.*—Commended for its very fine flavor and quality.

## 887. Francis Worth, Marshalltown, Chester Co., Pa., U. S.

## BUTTER IN POUND PRINTS.

*Report.*—Commended for very high flavor and excellent make.

## 888. Marshall Strode &amp; Son, Westchester, Pa., U. S.

## BUTTER IN POUND PRINTS.

*Report.*—Of very high quality, and tastefully prepared.

## 889. Brayton &amp; Castle, Strawberry Point, Iowa, U. S.

## BUTTER.

*Report.*—Commended for fine quality and superior skill in manufacture.

## 890. R. R. Stone, Elgin, Ill., U. S.

## CREAMERY BUTTER.

*Report.*—Commended for choice quality and fine appearance.

## 891. Lewis Jenison, Binghamton, Broome County, N. Y., U. S.

## BUTTER.

*Report.*—Commended for very fine flavor and quality.

## 892. J. T. Sawyer, Waverly, Tioga County, N. Y., U. S.

## BUTTER—SUMMER PACKED.

*Report.*—Commended for its fine, sweet flavor and well-preserved condition.

## 893. N. W. Morley, Baraboo, Wis., U. S.

## BUTTER.

*Report.*—Commended for very high flavor, and fine quality in general.

## 894. E. P. Vail, Marengo, Ill., U. S.

## DAIRY BUTTER.

*Report.*—Commended for its fine flavor and color and excellent make.

## 895. Stewart &amp; Mellen, Manchester, Iowa, U. S.

## CREAMERY BUTTER.

*Report.*—Commended for its clean, sweet flavor and firm texture, and superior excellence generally, the exhibit comprising samples from several different creameries.

## 896. Gooch &amp; Barber, Chicago, Ill., U. S.

## CREAMERY BUTTER.

*Report.*—Commended for superior excellence in all respects, especially its full and nutty flavor; the product of two creameries.

## 897. Avery, Wadsworth, &amp; Co., Morrisville, N. Y., U. S.

## BUTTER.

*Report.*—The best sample of butter in one-pound prints.

## 898. I. H. Wanzer, Elgin, Ill., U. S.

## BUTTER.

*Report.*—A fine sample of solid, well-made butter, beautiful and good flavor.

## 899. John T. Ellsworth, Barre, Mass., U. S.

## BUTTER.

*Report.*—The best sample of oldest make from the United States.

## 900. Wm. Dunn, Ingersoll, Ontario, Canada.

## BUTTER.

*Report.*—Commended for purity of flavor and skillful manufacture; the exhibit comprising butter in tubs and in pound prints.

## 901. Michael Ballantyne, Ingersoll, Ontario, Canada.

## BUTTER.

*Report.*—Commended for its fine flavor, color, texture, and make.

## 902. Hettle &amp; Inglis, Teeswater, Ontario, Canada.

## BUTTER.

*Report.*—Fine, well-made, finely flavored roll butter.

## 903. Philip W. Heymann, Copenhagen, Denmark.

## BUTTER.

*Report.*—The samples had been sealed from November 30, 1875, and from September 30, 1872, some of it being accordingly three and three-quarter years of age. The butter was found wonderfully well preserved, consistency, color, and taste excellent. Well put up for exportation.

## 904. The Danish Preserved Butter Co., Aarhus, Denmark.

## BUTTER.

*Report.*—The butter is well put up for exportation, and exceedingly well prepared; the taste very sweet and good.

## 905. Meyer &amp; Henckel, Copenhagen, Denmark.

## BUTTER COLORING.

*Report.*—A sample of butter coloring in oil. Commended for its novelty, utility, and beautiful color.



**906. Chr. Hansen, Copenhagen, Denmark.****RENNET EXTRACT AND BUTTER COLORING.**

*Report.*—1. A sample of liquid extract of rennet. Commended for its great strength, its perfect freedom from all matter foreign to its active principles, and its purity of flavor and odor.

2. Sample of butter coloring in oil. Commended for its novelty, utility, and beautiful color.

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**907. Casimiro Daninguez, Gijon, Oviedo, Spain.****BUTTER.**

*Report.*—Commended for its very good quality and state of preservation.

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**908. Ahlmann & Boysen, Hamburg, Germany.****BUTTER.**

*Report.*—Well-preserved and finely-flavored samples of butter from sweet and sour cream, with and without salt, put up in tin cases and small wooden packages.

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**909. H. J. Wijsman Brothers, Amsterdam, Netherlands.****UNSALTED BUTTER AND EDAMS CHEESE.**

*Report.*—Commended for fine flavor and well-preserved quality of fresh butter, put up in two small tin packages; also five samples of Edams cheese, very fine of their kind, rich, melting, delicious flavored, with long keeping qualities.

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**910. A. D. De Land, Sheboygan Falls, Wis., U. S.****CHEESE.**

*Report.*—Commended for flavor and full quality for shipping.

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**911. G. W. W. Briggs, Fredonia, Chautauqua County, N. Y., U. S.****CHEESE.**

*Report.*—Commended for fine flavor and quality.

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**912. John Shottuck, Norwich, Chenango County, N. Y., U. S.****CHEESE.**

*Report.*—Commended for richness and fine quality.

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**913. Z. Wilson, Palmyra, Wis., U. S.****CHEESE.**

*Report.*—Commended for its fine flavor and purity.

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**914. Moritz Lemmin, Edward, Wis., U. S.****CHEESE.**

*Report.*—Commended for its fine flavor and quality.

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**915. H. F. Dousman, Waterville, Wis., U. S.****CHEESE.**

*Report.*—Commended for fine quality for home use.

## 916. A. L. Bhee, North Gage, Oneida County, N. Y., U. S.

## FACTORY CHEESE.

*Report.*—Commended for its superior excellence in respect to flavor, quality, and texture.

---

## 917. H. S. Brown, West Winfield, Herkimer County, N. Y., U. S.

## FACTORY CHEESE.

*Report.*—Commended for superior flavor and richness and perfection in manufacture.

---

## 918. John Bergman, Homeworth, Columbiana County, Ohio, U. S.

## CHEESE—IMITATION OF SCHWEIZER KÄSE.

*Report.*—Commended for its richness and well-developed flavor, and close imitation of genuine Swiss cheese.

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## 919. A. D. Ford, Middleville, Herkimer County, N. Y., U. S.

## FACTORY CHEESE.

*Report.*—Four August and September cheeses, of fine make and quality.

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## 920. A. Wetherwax, Newville, Herkimer County, N. Y., U. S.

## FACTORY CHEESE.

*Report.*—A fine exhibit of ten September cheeses, of superior make and quality.

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## 921. A. Holdridge, West Burlington, Otsego County, N. Y., U. S.

## FACTORY CHEESE (RECTANGULAR IN FORM).

*Report.*—A cheese of choice quality, made in 1873.

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## 922. D. Darling, Gray P. O., Herkimer County, N. Y., U. S.

## FACTORY CHEESE.

*Report.*—Fine quality for shipping; superior for firm and close texture and purity of flavor.

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## 923. J. C. Murphy, Norway, Herkimer County, N. Y., U. S.

## FACTORY CHEESE.

*Report.*—Samples of superior cheese of August and September make, four in each.

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## 924. Mather Brothers, Sheboygan Falls, Wis., U. S.

## FACTORY CHEESE.

*Report.*—Very fine, clean, well made; a superior article.

---

## 925. L. L. Wight, Whitesboro', Oneida County, N. Y., U. S.

## FACTORY CHEESE.

*Report.*—Fine white cheese; texture close; rich and buttery flavor; clean and full.

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## 926. S. R. Swift, Paine's Hollow, Herkimer County, N. Y., U. S.

## FACTORY CHEESE.

*Report.*—Fine colored cheese of August and September make; superior for home use.

927. E. C. Rice, Fairfield, Herkimer County, N. Y., U. S.

FACTORY CHEESE.

*Report.*—Five cheeses of August make; very fine and nutty flavor; clean and full.

---

928. C. W. Richardson, Herkimer, Herkimer County, N. Y., U. S.

FACTORY CHEESE.

*Report.*—A superior exhibit of ten uncolored cheeses, of the very highest merit.

---

929. M. N. Seward, Lake Mills, Wis., U. S.

FACTORY CHEESE.

*Report.*—Very clean, rich, fine, and of superior make.

---

930. G. Holman, Conneautville, Pa., U. S.

FACTORY CHEESE.

*Report.*—Fine quality; well made; a superior lot.

---

931. Chester Hazen, Ladoga, Wis., U. S.

FACTORY CHEESE.

*Report.*—Fine; well made; good flavor and style.

---

932. Smith & Gates, Sheboygan Falls, Wis., U. S.

FACTORY CHEESE.

*Report.*—Fine shipping; very clean and well made; a superior lot.

---

933. Wm. Nash, Crossingville, Crawford County, Pa., U. S.

CHEESE.

*Report.*—Commended for fine quality of cheese, of superior make; artificially colored.

---

934. Fred. Saramo, Fort Plain, Montgomery County, N. Y., U. S.

FACTORY CHEESE.

*Report.*—Commended for its rich buttery texture and flavor and superior make.

---

935. A. H. Wheaton, Auroraville, Wis., U. S.

CHEESE.

*Report.*—The best sample of cheese of from thirty to fifty pounds.

---

936. Wm. Stowe, Whitewater, Wis., U. S.

CHEESE.

*Report.*—The best cheese of fifty to seventy pounds' weight, of United States make.

---

937. W. W. Wheeler, Trenton, Oneida County, N. Y., U. S.

FACTORY CHEESE.

*Report.*—Commended for skillful manufacture and excellent flavor, richness, and flaky texture.

## 938. Daniel Kuentz, Sheboygan Falls, Wis., U. S.

## CHEESE.

*Report.*—Commended for good flavor and quality for home use.

---

## 939. Seth Bonfoy, West Winfield, Herkimer County, N. Y., U. S.

## FACTORY CHEESE.

*Report.*—Superior in quality and flavor; cheese of September make

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## 940. G. W. Davis, Little Falls, Herkimer County, N. Y., U. S.

## FACTORY CHEESE.

*Report.*—Commended as superior for compactness and buttery texture and fine nutty flavor.

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## 941. Fred. Saramo, Fort Plain, Montgomery County, N. Y., U. S.

## CHEESE.

*Report.*—Commended for purity and fullness of flavor and fine buttery texture.

---

## 942. W. C. White, Kenosha, Wis., U. S.

## FACTORY CHEESE.

*Report.*—A fine sample of cheese, of superior quality and make, artificially flavored.

---

## 943. John Cole, Venango, Crawford County, Pa., U. S.

## FACTORY CHEESE.

*Report.*—A fine sample of shipping cheese; good stock, rich and well flavored.

---

## 944. Nelson Wood, Steuben, Oneida County, N. Y., U. S.

## FACTORY CHEESE.

*Report.*—Commended for its fine and well-developed flavor, and for its rich buttery texture.

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## 945. O. B. Bennett, Lamartine, Wis., U. S.

## CHEESE.

*Report.*—Commended for fine quality for home use.

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## 946. A. D. Farille, Lake Mills, Jefferson County, Wis., U. S.

## CHEESE.

*Report.*—Commended for fine flavor and quality for home use.

---

## 947. Wm. Marshall &amp; Co., Whitewater, Wis., U. S.

## CHEESE.

*Report.*—A fine quality of pale cheese, from Cold Springs and Hebron factories.

---

## 948. Carl Reich, Sheboygan, Wis., U. S.

## CHEESE.

*Report.*—Commended for its fine flavor and quality.

949. Hiram Cenover, Plymouth, Shelby County, Wis., U. S.

CHEESE.

*Report.*—Commended for fine quality and flavor for shipping.

---

950. John G. Cohoe, Fredonia, Chautauqua County, N. Y., U. S.

CHEESE.

*Report.*—Commended for fine quality and flavor.

---

951. Seth Bonfoy, West Winfield, Herkimer County, N. Y., U. S.

CHEESE.

*Report.*—The best sample of old cheese.

---

952. Evans & Stafford, Leicester, England.

CHEESE.

*Report.*—Commended for its fine texture and flavor.

---

953. Mark Chalcroft, Thamesford, Ontario, Canada.

CHEESE.

*Report.*—Commended for its full, nutty and clean flavor, and its superior richness, fine texture, and skillful manufacture.

---

954. James Ireland, Ingersoll, Ontario, Canada.

FACTORY CHEESE.

*Report.*—Commended for superior excellence in respect to flavor, richness, and texture.

---

955. Peter Dunn, Ingersoll, Ontario, Canada.

CHEESE, COLORED AND UNCOLORED.

*Report.*—Commended for its extraordinary high and delicious flavor, rich quality, and perfect texture.

---

956. Mark Chalcroft, Thamesford, Ontario, Canada.

FACTORY CHEESE.

*Report.*—Commended for its clean and well-developed flavor, its richness and general excellence.

---

957. J. H. Meays, Vienna, Oneida County, N. Y., U. S.

FACTORY CHEESE.

*Report.*—Commended for its superior excellence, in respect to fullness and purity of flavor and richness in quality.

---

958. James A. James, Nilestown, Ontario, Canada.

FACTORY CHEESE.

*Report.*—Superior in make, quality, and style.

---

959. E. N. Hopkins, Ingersoll, Ontario, Canada.

FACTORY CHEESE.

*Report.*—A superior made, fine flavored, rich article.

**960. Adam Bell, East Zora, Ontario, Canada.**

FACTORY CHEESE.

*Report.*—Very fine; well made; superior flavor.

---

**961. James Elliott, Brownsville, Ontario, Canada.**

FACTORY CHEESE.

*Report.*—Fine flavor; well made; superior in style.

---

**962. Hugh Mathison, Embro, Ontario, Canada.**

FACTORY CHEESE.

*Report.*—Finely made; fine stock; superior flavor.

---

**963. Thomas Ballantyne, Stratford, Ontario, Canada.**

FACTORY CHEESE.

*Report.*—Cheese up to highest quality in every respect.

---

**964. Wm. Anderson, Woodstock, Ontario, Canada.**

FACTORY CHEESE.

*Report.*—A superior sample of colored cheese; rich, stocky, and fine nutty flavor.

---

**965. O. P. Mabey, Courtland, Ontario, Canada.**

FACTORY CHEESE.

*Report.*—Fine flavor; well creamed; superior cheese.

---

**966. George Currie, Beachville, Ontario, Canada.**

FACTORY CHEESE.

*Report.*—Very fine flavor; rich; superior stock; clean.

---

**967. Alexander McKenzie, Kastnerville, Ontario, Canada.**

FACTORY CHEESE.

*Report.*—Commended for perfection in all its qualities.

---

**968. Mark Chalcroft, Thamesford, Ontario, Canada.**

FACTORY CHEESE.

*Report.*—A very fine sample of uncolored cheese, superior in flavor and texture.

---

**969. Wm. Gillard, Tavistock, Stratford, Canada.**

FACTORY CHEESE.

*Report.*—Very choice quality of uncolored cheese.

---

**970. David Morton, Cassells, Canada.**

FACTORY CHEESE.

*Report.*—Superior sample of rich, buttery and high-flavored white cheese.

---

971. David Morton, Cassells, Canada.

CHEESE.

*Report.*—Fine sample of cheese for shipping made on the American plan.

---

## 972. Thomas Ballantyne, Stratford, Ontario, Canada.

CHEESE.

*Report.*—Commended for rich buttery flavor and general excellence.

---

## 973. Wm. Huxley, Fullerton, Canada.

CHEESE.

*Report.*—Meritorious cheese for shipping purposes.

---

## 974. D. Chambers, Stratford, Canada.

CHEESE.

*Report.*—A fine sample of factory cheese for shipping.

---

## 975. Hugh Mathison, Embro, Canada.

CHEESE.

*Report.*—A sample of shipping cheese, of superior merit.

---

## 976. John Butler, Mount Elgin, Canada.

CHEESE.

*Report.*—Fine sample of cheese for shipping purposes.

---

## 977. I. W. Cahoe, Durham, Canada.

CHEESE.

*Report.*—A sample of shipping cheese, of superior merit.

---

## 978. D. B. Cahoe, Holbrook, Canada.

CHEESE.

*Report.*—A sample of shipping cheese, of superior merit.

---

## 979. Mark Chalcroft, Thamesford, Canada.

COLORED CHEESE.

*Report.*—Commended for fine flavor, texture, and color.

---

## 980. Adam Bell, Blanford, Canada.

PALE CHEESE FOR SHIPPING.

*Report.*—Commended for superior texture and flavor; the best sample of pale cheese of fifty to seventy-five pounds' weight shown at August exhibit.

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## 981. Wm. Manning, Belmont, Ontario, Canada.

COLORED CHEESE.

*Report.*—Commended for superior flavor, texture, and color.

---

**982. Adam Bell, Blanford, Canada.**

## UNCOLORED CHEESE.

*Report.*—Commended for its full and pure flavor, its richness and excellence in all respects.

---

**983. David Chalmers, Stratford, Canada.**

## FACTORY CHEESE.

*Report.*—A very choice quality of uncolored cheese; two exhibits.

---

**984. Adam E. Bell, Gorra & Blandford, Innerkip, Canada.**

## CHEESE.

*Report.*—The best cheese of thirty to fifty pounds at the special exhibition of dairy products, June 26 to July 6, of Canadian make.

---

**985. Peter Dunn, Ingersoll, Ontario, Canada.**

## CHEESE.

*Report.*—Well made; fine in flavor.

---

**986. Thomas Hankins, Holbrook, Ontario, Canada.**

## CHEESE.

*Report.*—The best sample of cheese of dairy manufacture shown at special exhibition of dairy products, June 26 to July 6.

---

**987. Robert Agur, Pond Mills, Ontario, Canada.**

## COLORED CHEESE.

*Report.*—Commended for superior flavor, texture, and color.

---

**988. Wm. Anderson, Woodstock, Canada.**

## CHEESE.

*Report.*—A sample of shipping cheese, of superior merit.

---

**989. Peter Dun, Ingersoll, Canada.**

## CHEESE.

*Report.*—A fine sample of cheese for shipping purposes.

---

**990. George Smith, Verschoyle, Canada.**

## CHEESE.

*Report.*—A sample of shipping cheese, of superior merit.

---

**991. James Ireland, Ingersoll, Ontario, Canada.**

## CHEESE.

*Report.*—A fine sample of cheese for shipping purposes.

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## 992. E. Caswell, Ingersoll, Ontario, Canada.

## CHEESE TRUCKLE.

*Report.*—The best cheese of three to ten pounds at the special exhibition of dairy products, June 26 to July 6.

---

## 993. P. Hemmingway, Corinth, Ontario, Canada.

## CHEESE.

*Report.*—The best cheese of fifty to seventy pounds' weight presented at the special exhibition of dairy products, June 26 to July 6, of factory make.

---

## 994. James Ireland, Ingersoll, Ontario, Canada.

## FACTORY CHEESE.

*Report.*—Finely made, clean and superior.

---

## 995. Peter Dunn, Ingersoll, Canada.

## FACTORY CHEESE.

*Report.*—The best three cheeses made on the American factory plan, in June, July, August, and September, respectively, according to schedule of June 15, 1876.

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## 996. Concord Dairy Association, Concord, Wis., U. S.

## CHEESE.

*Report.*—Commended for its fine flavor and quality.

---

## 997. James A. Robins, Avon Factory, Avon, Canada.

## CHEESE.

*Report.*—Commended for fine quality as shipping cheese.

---

## 998. Anna Paddon, Beachville, Canada.

## CHEESE.

*Report.*—A sample of shipping cheese, of superior merit.

---

## 999. E. Hunter, Mount Elgin, Canada.

## CHEESE.

*Report.*—A sample of shipping cheese, of superior quality.

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## 1000. H. S. Losee, Norwich, Canada.

## CHEESE.

*Report.*—A sample of shipping cheese, of superior merit.

---

## 1001. H. S. Losee, Norwich, Ontario, Canada.

## FACTORY CHEESE.

*Report.*—Commended for its superior excellence in regard to flavor, richness, and skillful manufacture.

---

## 1002. William Wilkinson, Ingersoll, Ontario, Canada.

## COLORED CHEESE.

*Report.*—Commended for superior flavor, color, and texture.

1003. William Wilkinson, Ingersoll, Ontario, Canada.

CHEESE.

*Report.*—A sample of great merit as shipping cheese.

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1004. William Wilkinson, Ingersoll, Ontario, Canada.

CHEESE.

*Report.*—Commended for its clean and pure flavor, its great richness, and general excellence.

---

1005. J. F. Williams, Galloway, Ontario, Canada.

PALE CHEESE FOR SHIPPING; FROM FIFTY TO SEVENTY POUNDS' WEIGHT.

*Report.*—Commended for superior texture and purity of flavor; a very choice sample.

---

1006. J. F. Williams, Galloway, Ontario, Canada.

UNCOLORED CHEESE.

*Report.*—Commended for its full, nutty, and pure flavor, and its superior richness, fine texture, and excellent make.

---

1007. James J. Williams, Galloway, Ontario, Canada.

CHEESE.

*Report.*—A sample of shipping cheese, of superior merit.

---

1008. John Chisholm, East Nissouri, Ontario, Canada.

COLORS CHEESE.

*Report.*—Commended for superior flavor, texture, and color.

---

1009. John Chisholm, East Nissouri, Ontario, Canada.

COLORS CHEESE.

*Report.*—Commended for its full, nutty, and pure flavor, and its superior richness and compact texture and excellent make.

---

1010. John Chisholm, Ingersoll, Ontario, Canada.

FACTORY CHEESE.

*Report.*—Fine, rich, good style; superfine flavor.

---

1011. George Aster, Bristol, England.

COLORING FOR CHEESE AND BUTTER.

*Report.*—Greatly concentrated in strength, and of beautiful golden color, with permanent retention in the manufactured products.

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1012. George Aster, Bristol, England.

COLORING FOR CHEESE—AN EXTRACT OF ANNOTTO.

*Report.*—Commended for its greatly concentrated form, and the rich, creamy appearance its use imparts to cheese.

## 1013. George Aster, Bristol, England.

## THREE RENNETS PRESERVED.

*Report.*—Commended for their excellent state of preservation and freedom from offensive odors.

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## 1014. The Joint Vaults of Roquefort, France.

## CHEESE.

*Report.*—Commended for its excellent flavor and richness.

---

## 1015. José Garcia Moron, Cabezas Rubias, Huelva, Spain.

## CHEESE.

*Report.*—Commended for good taste and quality.

---

## 1016. Placido Falero y Fajardo, Fuente de Pedro Navorro, Cuenca, Spain.

## CHEESE.

*Report.*—Commended for good taste and quality.

---

## 1017. José Maria Coca, Daimiel, Ciudad Real, Spain.

## CHEESE.

*Report.*—Commended for good quality and taste.

---

## 1018. Manuel Villahermosa, Manzanares, Ciudad Real, Spain.

## CHEESE.

*Report.*—Commended for its very good taste and quality.

---

## 1019. Maria Josefa Melgarejo, San Clemente, Cuenca, Spain.

## CHEESE.

*Report.*—Commended for good taste and quality.

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## 1020. Viscount of Boa Vista, Beja, Portugal.

## CHEESE.

*Report.*—Commended for its fine flavor and quality.

---

## 1021. Jose Miguel d'Oliveira, Moura, Beja, Portugal.

## CHEESE.

*Report.*—Commended for fine flavor and quality.

---

## 1022. Jose Guerreiro da Lanca's Nephews, Ferreira, Beja, Portugal.

## CHEESE.

*Report.*—Commended for fine flavor and quality.

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## 1023. Jose da Costa Franco, Beja, Portugal.

## CHEESE.

*Report.*—Commended for its fine flavor and quality.

## 1024. Eliziario Casal, Cea, Guarda, Portugal.

## CHEESE.

*Report.*—Commended for its fine flavor and quality.

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## 1025. George Elia, Buenos Ayres, Argentine Republic.

## CHEESE.

*Report.*—A very good imitation of Parmesan cheese, and very well preserved.

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## 1026. Eduardo Guscetti, Milan, Italy.

## CHEESE—PARMESAN AND STRACHINO.

*Report.*—Commended for richness of taste and excellent preservation, some of the Parmesan being five years old.

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## 1027. Agrarian Committee of Chiavari, Italy.

## ROMAN CHEESE.

*Report.*—Commended for the following reasons :

1. Cheapness (the food of the working classes).
  2. Good taste.
  3. Well preserved.
- 

## 1028. K. H. de Jong, Hoorn, Netherlands.

## CHEESE.

*Report.*—Commended for the following reasons :

1. Good preparation of North Holland or Edam cheese.
  2. Very well adapted for export.
  3. Good flavor.
- 

## 1029. D. Goede, Alkmaar, Netherlands.

## EDAMMER AND GOUDA CHEESE.

*Report.*—Commended for the following reasons :

1. Clean and good preparation, without spots or holes.
  2. Perfect conservation.
  3. Good taste and flavor.
- 

## 1030. L. W. Heil, Haarlem, Netherlands.

## CHEESE.

*Report.*—Commended for the following reasons :

1. Good preparation of Edam cheese.
  2. Very well preserved, and adapted for export.
  3. Flavor very good.
- 

## 1031. A. Van Vliet, Berg Ambacht, Netherlands.

## CHEESE (STOLK).

*Report.*—Commended for the following reasons :

1. Good and clean preparation.
2. Perfect conservation.
3. Good flavor.

**1032. Dutch Agricultural Society of North and South Holland, Netherlands.****CHEESE.**

*Report.*—Commended for the following reasons:

1. A large collection of different kinds of cheese,—cheese of Gouda, Dirby, May cheese, common cheese, green spice cheese, Edammer cheese, green sheeps' cheese, and others.
  2. Very clean and good preparation, perfectly preserved.
  3. Good taste and flavor.
- 

**1033. Norwegian Preserving Co., Mandel, Norway.****BOILED BEEF, PTARMIGAN, AND EXTRACT OF BEEF—ALL HERMETICALLY SEALED.**

*Report.*—Commended for the style in which the exhibit is put up, and for the high state of preservation in which the original qualities of the meat were maintained.

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**1034. L. Schepp, New York, N. Y., U. S.****DESICCATED COCOANUT, PRESERVED FRUIT.**

*Report.*—Commended for rich natural flavor and excellent condition of fruit.

---

**1035. R. B. Blower, Woodland, Cal., U. S.****DRIED RAISINS.**

*Report.*—Commended for the size, flavor, and preservation of Muscatel, sultana, black malvasia, and Malaga raisins.

---

**1036. Thomas Richie & Co., Jacksonville, Fla., U. S.****JELLY AND MARMALADE OF FLORIDA ORANGES.**

*Report.*—The articles are well prepared and of good taste and preservation, and neatly put up. This enterprise seems worthy of encouragement as a new and valuable industry.

---

**1037. Joseph M. Chambers, Dover, Del., U. S.****CANNED PEACHES.**

*Report.*—Commended for superior quality and condition of peaches.

---

**1038. F. H. Perry, Providence, R. I., U. S.****PRESERVED FRUITS.**

*Report.*—A fine exhibit of excellent Bartlett pears and crab-apples.

---

**1039. Warner, Rhodes, & Co., Philadelphia, Pa., U. S.****PRESERVED FRUITS.**

*Report.*—Commended for good quality and condition of fruit (peaches, pears, and quince preserves), and for cheapness.

---

**1040. Burnham & Morrill, Portland, Me., U. S.****PRESERVED FRUITS.**

*Report.*—Commended for the fine condition and quality of fruit (blueberries).

## 1041. Richardson &amp; Robbins, Dover, Del., U. S.

## PRESERVED FRUITS.

*Report.*—Commended for variety and general good quality and condition of fruit.

---

## 1042. Githens &amp; Rexasmer, Philadelphia, Pa., U. S.

## PRESERVED FRUITS.

*Report.*—Commended for good quality, condition, flavor, and syrup of peaches, pears, and quinces; also for tasteful exhibit.

---

## 1043. F. M. Clarkson &amp; Son, Bridgeville, Del., U. S.

## CONSERVED AND EVAPORATED FRUITS AND VEGETABLES.

*Report.*—Commended for good condition and quality of twenty-five kinds of fruit and vegetables; dried by a process peculiar to the company.

---

## 1044. Hampton Kelly, East Portland, Oregon, U. S.

## PRESERVED FRUITS.

*Report.*—An exhibit of condensed apple cider, butter, and jelly; well preserved, novel, and useful.

---

## 1045. Farmers' Fruit Preserving Co., Lebanon, Del., U. S.

## PRESERVED FRUITS.

*Report.*—An exhibit of dried fruits; of fine flavor, color, and condition.

---

## 1046. Alden Fruit Drying Co., Oregon City, Oregon, U. S.

## PRESERVED FRUITS.

*Report.*—A collection of dried fruits, prepared by the Alden process; of fine flavor, color, and condition.

---

## 1047. W. M. Plummer, Portland, Oregon, U. S.

## PRESERVED FRUITS.

*Report.*—Collections of dried fruits, prepared by the Plummer process; of fine flavor, color, and condition.

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## 1048. P. J. Ritter, Philadelphia, Pa., U. S.

## PRESERVED FRUITS.

*Report.*—Commended for good condition and flavor of fruit butter (apple and quince), and fine general exhibit.

---

## 1049. Crosse &amp; Blackwell, London, England.

## PRESERVED FRUITS.

*Report.*—The fruits have been prepared with great care from good materials, having a richness of taste rarely equaled.

---

## 1050. George McEwen &amp; Son, Adelaide, South Australia, Australia.

## PRESERVED FRUITS.

*Report.*—Commended for the variety and excellence of a collection of jams and marmalades.

## 1051. Thomas Hardy, Adelaide, South Australia, Australia.

## PRESERVED FRUITS.

*Report.*—Three varieties of raisins, Muscatels and sultana; all good in quality of fruit and in preparation.

---

## 1052. F. Wurm, Adelaide, South Australia, Australia.

## PRESERVED FRUITS. •

*Report.*—Commended for variety and general excellence of flavor and condition of raisins, figs, and other sub-tropical fruits.

---

## 1053. C. Hoff, New Caledonia, New South Wales, Australia.

## CANNED FRUITS.

*Report.*—Pine-apple preserved whole; good fruits, with excellent flavor.

---

## 1054. Robert Thomson, Gordon Town, Jamaica.

## PRESERVED FRUIT.

*Report.*—Commended for the fine flavor and good preservation of rose apple, a cheap fruit growing abundantly without cultivation.

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## 1055. Jamaica Centennial Committee, Jamaica.

## FRUITS.

*Report.*—A large and varied collection of fruits, showing all the principal products of the island.

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## 1056. J. W. Butcher, Halifax, Nova Scotia.

## PRESERVED FRUITS (STRAWBERRIES AND CRANBERRY JELLY).

*Report.*—Fruits good and well preserved.

---

## 1057. R. B. Noble, Richibucto, New Brunswick.

## PRESERVED BLUEBERRIES.

*Report.*—The fruit is fresh and the flavor good.

---

## 1058. Abrikossof &amp; Sons, Moscow, Russia.

## PRESERVED FRUITS IN BOTTLES; FRUIT PASTE, ETC.

*Report.*—Commended for good taste, fine appearance, and careful preservation.

---

## 1059. Lapin Brothers, St. Petersburg, Russia.

## PRESERVED FRUITS AND BONBONS.

*Report.*—Commended for careful preparation, good, fresh flavor, and variety.

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## 1060. Koodriavzef Brothers, Moscow, Russia.

## CANDIED FRUIT, FRUIT PASTE, AND GINGERBREAD.

*Report.*—Commended for careful preparation, freshness, and good flavor and appearance.

**1061. Paul Joorkin, St. Petersburg, Russia.****FRUIT PASTE AND CRYSTALLIZED FRUIT.**

*Report.*—Commended for excellent flavor, beautiful color, freshness, and careful preparation.

---

**1062. The Imperial Board of Agriculture, Industry, and Commerce, Tokio, Japan.****COLLECTION OF FRUITS, SUGAR, MOLASSES, AND FLOUR.**

*Report.*—This large collection of fruits preserved in spirits of wine and sugar, of sugar, molasses, and flour, is very interesting as showing the fertility of the soil of Japan and the adaptation of its climate to a great variety of cultures.

---

**1063. Paul Chenu, Paris, France.****CRYSTALLIZED FRUITS.**

*Report.*—Very fine fruits, well prepared and preserved.

---

**1064. Ch. Ecorcheville & H. Legrand, Paris, France.****CRYSTALLIZED FRUITS.**

*Report.*—A splendid collection of admirably-preserved crystallized fruit, well preserved and most beautifully and tastefully put up.

---

**1065. Lesage & Paignard, Paris, France.****FRUIT JAMS AND JELLIES.**

*Report.*—Their fruit jams are delicious; their fruit jellies are wonderfully clear and fresh. Commended for the careful and elegant as well as ingenious way in which their products are put up

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**1066. Joseph Colin, Nantes, France.****FRUITS PRESERVED IN SYRUP.**

*Report.*—Commended for the following reasons:

1. Good quality of the syrup, very clear and light.
  2. Excellent taste of the fruit.
  3. Freshness and solidity of the fruit.
- 

**1067. A. Landrin, Paris, France.****PRESERVED FRUIT AND FRUIT JUICES.**

*Report.*—His chestnuts in syrup are very good; his cherries preserved in water without sugar, and his mirabelle plums, are very well prepared, to meet cheaply and satisfactorily the requirements of pastry-cooks and housekeepers; so is his strawberry juice.

---

**1068. Joseph Nègre, Grasse, France.****PRESERVED FRUITS.**

*Report.*—A very fine collection of crystallized fruits, of excellent taste, color, freshness, and preservation, and put up with the greatest taste.

---

**1069. F. Lecourt, Paris, France.****FRUIT IN SYRUP.**

*Report.*—While these fruits are of good taste and present a good appearance, they are remarkable for their cheapness, which puts them within the reach of every one.



## 1070. A. Dufour &amp; Co., Bordeaux, France.

## PRUNES.

*Report.*—Fruit very carefully chosen, well put up, and very fresh.

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## 1071. Otto Herreborg, Copenhagen, Denmark.

## PRESERVED FRUITS.

*Report.*—A collection of six fruit preserves and extracts, well put up, and of fine natural flavor.

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## 1072. D. Joaquin Fernandez, Seville, Spain.

## OLIVES, PRESERVED.

*Report.*—Remarkable for their good preservation, excellent taste, and freshness.

---

## 1073. Puig &amp; Llacostera Brothers, Barcelona, Spain.

## OLIVE FARCIES (STUFFED OLIVES).

*Report.*—His olives stuffed with anchovies and capers (olive farcies) are delicious, and put up with great taste and fancy.

---

## 1074. Manuel Carmona, Seville, Spain.

## OLIVES PRESERVED.

*Report.*—Their queen olives (Reina) are very large, hard, well flavored, and perfectly preserved.

---

## 1075. Francisco Albear &amp; Ward, Montilla, Cordoba, Spain.

## PRESERVED PRUNES.

*Report.*—An exhibit of prunes, very large and well preserved.

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## 1076. J. A. Mark, Malaga, Spain.

## MALAGA RAISINS.

*Report.*—Immense size and good condition of Malaga raisins.

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## 1077. Loring Brothers, Malaga, Spain.

## MALAGA RAISINS.

*Report.*—Fine quality and large size of dried Malagas.

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## 1078. Antonio Postigo, Malaga, Spain.

## RAISINS.

*Report.*—Commended for a large variety of superior Malaga raisins, remarkable for their quality, taste, and size.

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## 1079. Federico Gros &amp; Co., Malaga, Spain.

## MALAGA RAISINS.

*Report.*—An exhibit of Malaga raisins, of superior quality.

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## 1080. Francisco Pellicer, Porrero, Tarragona, Spain.

## RAISINS.

*Report.*—Commended for good flavor and preservation of raisins.

## 1081. F. N. Casado, Malaga, Spain.

## MALAGA RAISINS.

*Report.*—Commended for superior size and quality of Malaga raisins.

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## 1082. Rafael de Vives, Villa de Oliva, Valencia, Spain.

## RAISINS.

*Report.*—Commended for good condition of raisins.

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## 1083. Blas Antonio Canamas, Valencia, Spain.

## MUSCATEL RAISINS.

*Report.*—Commended for fine condition of Muscatel raisins.

---

## 1084. Parent Brothers, Barcelona, Spain.

## PRESERVED FRUIT.

*Report.*—An exhibit of canned fruits, pears, peaches, and greengages; fruit good and well preserved.

---

## 1085. José Luna, La Rambla, Barcelona, Spain.

## PRESERVED FRUITS.

*Report.*—He exhibits eighteen varieties of fruits, canned and preserved, all of good quality and condition, and some excellent.

---

## 1086. José Elvira, Logroño, Spain.

## CANNED PEACHES.

*Report.*—He exhibits peaches in cans: they are large, solid, well preserved, and of good flavor.

---

## 1087. Puzini Brothers, Cordoba, Spain.

## PRESERVED FRUIT.

*Report.*—Commended for good taste and color of six varieties of fruit.

---

## 1088. Juan Kreisler, Malaga, Spain.

## MALAGA RAISINS.

*Report.*—Commended for good quality and condition of Malaga raisins.

---

## 1089. José Damian Capsir, Puebla de Rugat, Valencia, Spain.

## PRESERVED FRUITS.

*Report.*—Commended for good preservation of fruit in grape sugar, and for cheapness.

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## 1090. Antonio J. Gomez, Malaga, Spain.

## MALAGA RAISINS.

*Report.*—Commended for superior size and flavor of Malaga raisins.

## 1091. Lorenzo Arrom, Llubí, Balearic Islands.

## CAPERS AND ALLCAPARONES.

*Report.*—His common capers as well as his allcaparones (large capers) are prepared with splendid wine vinegar; their taste is excellent.

## 1092. Juan Boschi &amp; Co., Havana, Cuba.

## GUAVA JELLY AND MARMALADE.

*Report.*—Very good guava jelly and marmalade.

## 1093. Costa &amp; Co., Havana, Cuba.

## GUAVA PASTE AND GUAVA JELLY.

*Report.*—Guava paste and guava jelly; both good in appearance and taste.

## 1094. J. Gomez &amp; Co., Havana, Cuba.

## GUAVA JELLY.

*Report.*—Commended for good quality of guava jelly.

## 1095. Tranquilino Garcia, Havana, Cuba.

## GUAVA MARMALADE.

*Report.*—An elegant exhibit of excellent guava marmalade.

## 1096. Jose da Conceição Guerra, Elvas, Portalegre, Portugal.

## OLIVES.

*Report.*—Good olives; very well preserved, fresh, and of good color.

## 1097. Joaquim Jose da Guerra, Elvas, Portalegre, Portugal.

## OLIVES.

*Report.*—Very fine olives; fresh and well preserved.

## 1098. Jose Maria da Fonseca Regallo, Campo Mayor, Portalegre, Portugal.

## OLIVES.

*Report.*—These olives are very good and well preserved.

## 1099. João Pereira Serzedello, Elvas, Portalegre, Portugal.

## GREEN OLIVES.

*Report.*—His green olives are very well prepared.

## 1100. Lino Jose de Campos, Oporto, Portugal.

## BLACK OLIVES.

*Report.*—Their azeitonas (black olives) are excellent.

## 1101. Leal, Costa, &amp; Co., Lisbon, Portugal.

## BLACK OLIVES.

*Report.*—Their azeitonas (black olives), which are only grown in Portugal, are excellent.

**1102. Jose Cândido Sant' Anna, Elvas, Portalegre, Portugal.****OLIVES.**

*Report.*—Two kinds of olives: 1, split olives; 2, olives whole; both very good.

---

**1103. Viscontessa of Olleiros, Castello Branco, Portugal.****OLIVES.**

*Report.*—Olives very carefully prepared; fresh; of good flavor and fine color.

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**1104. St. Benito d'Ave Maria Convent, Oporto, Portugal.****DRIED FRUITS.**

*Report.*—Citron and maracuja, preserved and dried in sugar; of fine appearance and flavor.

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**1105. Cellas Convent, Santo Antonio dos Olivaes, Portugal.****DRIED FRUITS.**

*Report.*—An elegant collection of fruits dried in sugar.

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**1106. Balthazar Rodrigues Castanheiro, Lisbon, Portugal.****DRIED FRUITS.**

*Report.*—An elegant collection of fruits dried in sugar.

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**1107. L. S. P. Mascarenhas, Portimão, Faro, Portugal.****FIG CHEESE.**

*Report.*—Preparation of figs and almonds, of good material; fancy style; well preserved.

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**1108. Luiz de Mendonca Mello, Tavira, Faro, Portugal.****DRIED FIGS.**

*Report.*—Fruit good; light-colored; sweet; well kept.

---

**1109. Maria da Gloria & Co., St. Ildefonso, Oporto, Portugal.****DRIED FRUITS.**

*Report.*—Well-preserved peaches and green figs, sugared and dried.

---

**1110. Maria do Livramento Gomes Mattos, Bomforden, Oporto, Portugal.****FRUIT.**

*Report.*—Citron and four other kinds of fruit, well preserved in sugar and very tastefully prepared.

---

**1111. Joaquim d'Almeida Negrão, Portimão, Oporto, Portugal.****DRIED FIGS.**

*Report.*—Fruit good; well pressed; well preserved.

---

**1112. Miguel Serrao Burguete, Sardoal, Santarem, Portugal.****DRIED FIGS AND PRUNES.**

*Report.*—Fruit of good size and quality; well preserved; sweet.

**1113. P. Antonio Freire Corte Real, Fundão, Castello Branco, Portugal.****DRIED FIGS.**

*Report.*—Fruit small; of good color; well dried; sweet and cheap.

---

**1114. Albino Justiniano Carvalho, Condeixa, Coimbra, Portugal.****DRIED FIGS.**

*Report.*—Fruit large; fine; sweet; in good condition.

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**1115. Jose Joaquim das Neves & Sons, Lisbon, Portugal.****DRIED FIGS.**

*Report.*—Fruit of good appearance and condition, and cheap.

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**1116. Luiz Antonio de Magalhaes, Fundão, Castello Branco, Portugal.****DRIED PEARS.**

*Report.*—Fruit large; fine; well dried; sweet; of good flavor.

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**1117. Francisco de Sa Teixeira, Salzedas, Mondim, Vizeu, Portugal.****DRIED FIGS.**

*Report.*—Fruit small; of good color; sweet, and cheap.

---

**1118. Jose Maria Dantas Pimenta, Torres Novas, Santarem, Portugal.****RAISINS.**

*Report.*—Fruit good; well kept; sweet.

---

**1119. João Nunes da Conceição, Elvas, Portalegre, Portugal.****SUGARED FRUITS.**

*Report.*—Fruits good; well preserved; tastefully put up.

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**1120. Conceição Marques Alves Soura, St. Ildefonso, Oporto, Portugal.****SUGARED FRUIT.**

*Report.*—A very pretty collection of sugared and dried fruit, of good preservation and taste.

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**1121. Fernando Rodrigues & Nephew, Lisbon, Portugal.****CANNED FRUITS.**

*Report.*—A large collection of fruits in good condition and of good flavor.

---

**1122. P. Cavalleri & Co., Lisbon, Portugal.****PRESERVED FRUIT.**

*Report.*—A good collection of preserved fruit, in cans and jars,—peaches, pears, quinces, gages, cherries; fruit good, well put up, and of fine appearance.

---

**1123. Jose da Conceição Guerra, Elvas, Portalegre, Portugal.****PRESERVED FRUITS.**

*Report.*—A very tasteful collection of sugared fruits; well made and preserved.

**1124. Antonio Joaquim Pires, Lisbon, Portugal.****PRESERVED FRUIT.**

*Report.*—A collection of fruit, for the most part very good in quality, preservation, and taste.

---

**1125. Leal, Costa, & Co., Lisbon, Portugal.****PRESERVED FRUIT.**

*Report.*—Two varieties of peach and quince marmalade; very well prepared, and of good quality.

---

**1126. Emilia Andrade Larcher, Portalegre, Portugal.****BRANDY CHERRIES.**

*Report.*—Fruit good; well preserved; taste not rivaled.

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**1127. João da Silva Ferrão de Castello Branco, Lisbon, Portugal.****PRESERVED FRUITS.**

*Report.*—Preserved peaches and apricots in several forms; fruit fine, well preserved, and of good taste.

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**1128. Jose Libanio Gomes, Portimão, Faro, Portugal.****DRIED FIGS.**

*Report.*—Fruit large, fine, and well preserved.

---

**1129. Ornellas & Lister, Lisbon, Portugal.****CANNED FRUITS AND JELLIES.**

*Report.*—A varied collection of fruits, of good quality and well preserved; also of jellies and marmalade.

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**1130. Ornellas & Lister, Lisbon, Portugal.****OLIVES.**

*Report.*—Very good olives, carefully chosen, and well preserved.

---

**1131. Julio Bivar d'Azevedo Salgado, Sardoal, Santarem, Portugal.****DRIED FIGS AND PEARS.**

*Report.*—Fruits small, good, well dried, and in good condition.

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**1132. A. F. Macropodan, Smyrna, Turkey.****PRESERVED FRUITS.**

*Report.*—An exhibit of dried figs, large, fine, well preserved.

---

**1133. G. L. Mark, Isle of Samos, Turkey.****MUSCAT AND BLACK RAISINS.**

*Report.*—An exhibit of Muscat and black raisins; the former of fine quality and appearance, the latter of fair quality and cheap.

## 1134. M. J. de Castro, Rio de Janeiro, Brazil.

## PRESERVED FRUIT.

*Report.*—An excellent lot of fruit jams.

---

## 1135. Santos &amp; Ferreira, Rio de Janeiro, Brazil.

## PRESERVED FRUITS.

*Report.*—Commended for the uniform excellence of their entire exhibit.

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## 1136. D. J. V. Perdiggão, Maranhão, Brazil.

## PRESERVED FRUITS.

*Report.*—Fruit (three varieties) all good; flavor fine; pine-apple excellent.

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## 1137. Commission of the Province of Rio de Janeiro, Brazil.

## PRESERVED FRUIT.

*Report.*—Commended for excellent flavor and good preservation of mango marmalade.

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## 1138. Roverano Brothers, Buenos Ayres, Argentine Republic.

## PRESERVED FRUITS.

*Report.*—The exhibit of preserved lemons, oranges, figs, and citron is good as to fruit, syrup, preservation, and appearance.

---

## 1139. Chev. Dr. Cesare Leopardi Rosso, Syracuse, Sicily, Italy.

## RIPE OLIVES PRESERVED, NATURAL STATE.

*Report.*—Commended for the following reasons:

1. Very well preserved.
  2. Good flavor.
- 

## 1140. Raffaele Lanzara, Salerno, Italy.

## ORANGES AND LEMONS.

*Report.*—Commended for fragrance, fine peel, and good preservation.

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## 1141. Francesco Gargiulo, Sorrento, Italy.

## ORANGES AND LEMONS.

*Report.*—Commended for their large size and good preservation.

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## 1142. Salvatore Caliri, Messina, Italy.

## PRESERVED FRUIT (LAZZERUOLE CANDIDO).

*Report.*—Commended for excellent condition and appearance, good taste and syrup.

---

## 1143. Joachim Loreti, Rome, Italy.

## PRESERVED FRUITS (MIXED FRUITS).

*Report.*—Commended for the good condition and appearance of fruit and syrup.

**1144. A. Tschurtschenthaler, Bozen, Austria.****PRESERVED FRUITS.**

*Report.*—An exhibit of sixteen preparations of fruits, dried and preserved in various ways; all good; some excellent.

---

**1145. Leopold Sandpichler, Görz, Austria.****PRESERVED FRUITS.**

*Report.*—A large collection of fruits in sugar and crystallized, with good taste and in good preservation.

---

**1146. B. Dupuch, Limache, Chili.****STRAWBERRIES.**

*Report.*—Exhibit of quince jelly; transparent; fine. Strawberries preserved; good taste; well kept. Apricots preserved; good taste; well kept.

---

**1147. Wm. Underwood & Co., Boston, Mass., U. S.****PRESERVED VEGETABLES.**

*Report.*—Well and carefully preserved.

---

**1148. Githens & Rexsamer, Philadelphia, Pa., U. S.****PRESERVED VEGETABLES.**

*Report.*—Commended for—1. Great variety.

2. Good taste.

3. Care in putting up.

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**1149. J. Winslow Jones, Portland, Me., U. S.****PRESERVED GREEN CORN.**

*Report.*—Very carefully preserved.

---

**1150. W. H. Slocomb & Brothers, Philadelphia, Pa., U. S.****PRESERVED TOMATOES.**

*Report.*—Well preserved.

---

**1151. Warner, Rhodes, & Co., Philadelphia, Pa., U. S.****PRESERVED VEGETABLES.**

*Report.*—Commended for—1. Careful preparation.

2. Good flavor.

---

**1152. Burnham & Morrill, Portland, Me., U. S.****VEGETABLE AND ANIMAL EXTRACTS.**

*Report.*—Vegetable, beef, and bouilli soups, all three well arranged, of clear composition and good taste, well preserved, well seasoned, substantial, and handsomely put up.

---

**1153. Kemp, Day, & Co., New York, N. Y., U. S.****PRESERVED VEGETABLES.**

*Report.*—Commended for—1. Most careful packing.

2. Flavor well preserved.

3. Form and appearance well preserved.



**1154. Portland Packing Co., Portland, Me., U. S.****SUGAR CORN (HERMETICALLY SEALED).**

*Report.*—1. Very carefully put up.  
2. Taste and form well preserved.

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**1155. Anderson & Campbell, Camden, N. J., U. S.****PRESERVED VEGETABLES.**

*Report.*—Commended for—1. Careful packing.  
2. Flavor and form well preserved.

---

**1156. Louis McMurray, Frederick, Md., U. S.****MOUNTAIN SUGAR CORN.**

*Report.*—Well and carefully preserved.

---

**1157. E. C. Hazard & Co., New York, N. Y., U. S.****PRESERVED VEGETABLES.**

*Report.*—1. A fine collection of great variety.  
2. Carefully and tastefully put up.  
3. Flavor and shape of vegetable well preserved.

---

**1158. Farmers' Fruit Preserving Co., Lebanon, Del., U. S.****PUMPKINS.**

*Report.*—Pumpkins very well preserved.

---

**1159. John Yacovlef, St. Petersburg, Russia.****PRESERVED VEGETABLES IN TIN CANS.**

*Report.*—Commended for careful selection of vegetables, good fresh color, excellent flavor, and variety.

---

**1160. L. Dardelle & Co., Paris, France.****MIXED DRIED PORTABLE VEGETABLE SOUP.**

*Report.*—This product is wonderfully cheap, and represents a great amount of nutritious matter in a very small compass. It recommends itself strongly for travelers and armies.

---

**1161. Joseph Colin, Nantes, France.****PRESERVED VEGETABLES.**

*Report.*—This fine collection of vegetables is very well preserved; the products are tasty, fresh, solid, and their color is very fine.

---

**1162. Cormier Son & Veron, Paris, France.****PRESERVED VEGETABLES.**

*Report.*—It is a very fine collection of vegetables, very well preserved; commended for taste, color, and freshness; put up most carefully.

## 1163. M. Passion, Paris, France.

## PRESERVED VEGETABLES.

*Report.*—The products recommend themselves by their taste, freshness, and general good preservation.

---

## 1164. Caillebotte &amp; Dumagnou, Paris, France.

## PRESERVED VEGETABLES.

*Report.*—These vegetables are well preserved; well cooked; carefully put up; and their taste, color, and shape well preserved.

---

## 1165. F. Lecourt, Paris, France.

## PRESERVED VEGETABLES.

*Report.*—Commended for the following reasons:

1. Very good flavor.
  2. Good form.
  3. Good color.
  4. Careful preservation.
- 

## 1166. Bonfils Brothers &amp; Co., Carpentras, France.

## PRESERVED TRUFFLES.

*Report.*—A splendid collection of truffles, of immense size and chosen with the greatest care; unsurpassed.

---

## 1167. Chevallier-Appert, Paris, France.

## PRESERVED VEGETABLES, CHOCOLATE, FRUITS PRESERVED IN SYRUP, AND PRESERVED MEATS.

*Report.*—The vegetables put up with great care; they are well chosen, solid, fresh, of a fine color, and in an excellent state of preservation.

Chocolate of very fine cacao and sugar; superior preparation.

Fruits preserved with great care, in excellent syrup; of delicious flavor and very fine appearance.

Meats of good quality, preserved with the greatest care.

---

## 1168. P. Cavalleri &amp; Co., Lisbon, Portugal.

## VEGETABLES.

*Report.*—His preserved peas are remarkably good; well chosen and well put up; fresh and tasty.

---

## 1169. Fabrica Progresso, Lisbon, Portugal.

## PRESERVED VEGETABLES.

*Report.*—A very fine and large collection of preserved vegetables; of excellent flavor and freshness; in good vinegar.

---

## 1170. Giovanni Serrasanetti, Bologna, Italy.

## STEWED TOMATOES (TWO KINDS) IN CANS.

*Report.*—Commended for the following reasons:

1. Very good flavor.
2. Fresh and well preserved.

1171. **Francisco Napoli, Salerno, Italy.**

## PRESERVED VEGETABLES.

*Report.*—Commended for the following reasons:

1. Dried and fresh tomatoes, in cans, very well preserved.
  2. Good flavor, without any extra spicing.
- 

1172. **Nicolo Massardo, Sanpierdarena, Genoa, Italy.**

## PRESERVED VEGETABLES.

*Report.*—1. Black mushroom in olive oil (cepo), and sweet peas in cans, very well preserved.

2. Good flavor.
- 

1173. **Chr. Aug. Thorne, Moss, Norway.**

## PRESERVED VEGETABLES.

*Report.*—Commended for—1. Variety.

2. Good taste.
- 

1174. **Z. Wikström, Stockholm, Sweden.**

## PRESERVED VEGETABLES.

*Report.*—Commended for the following reasons:

1. Great variety of vegetables.
  2. Very carefully and tastefully put up, so as to preserve the flavor and natural appearance.
- 

1175. **Wilson Packing Co., Chicago, Ill., U. S.**

## PRESSED CANNED COOKED BEEF, HAM, AND TONGUE.

*Report.*—Commended for—1. Novelty of the process.

2. The perfect retention of the flavor and texture of the meat.
  3. The cheapness of the product.
- 

1176. **J. Winslow Jones, Portland, Me., U. S.**

## CANNED ROAST BEEF.

*Report.*—Commended for the following reasons:

1. Its power to resist vicissitudes of climate, the sample having been put up for the U. S. Navy in 1873, carried to Yokohama, Japan, and returned to Portland in 1876, and was when opened perfectly free from any odor or taste of age.
  2. Economy, requiring no cooking to prepare it for use.
- 

1177. **W. K. Lewis & Brothers, Boston, Mass., U. S.**

## CANNED BEEF AND TURKEY.

*Report.*—The meat retains its special flavor in a high degree.

---

1178. **Atmore & Son, Philadelphia, Pa., U. S.**

## MINCED MEAT.

*Report.*—Commended for the following reasons:

1. The perfect mixing and seasoning of the ingredients.
2. Its good keeping quality (specimens examined which had been kept four years in a vessel not sealed, yet retained their good quality with scarcely any change).

## 1179. Joshua Wright &amp; Son, Philadelphia, Pa., U. S.

## MINCED MEAT.

*Report.*—Commended for the following reasons:

1. Novelty in the method of putting it up; the meat after being prepared is hermetically sealed in tin cans.
  2. Its high keeping quality; specimens were opened and found in good condition which had been put up twenty years.
- 

## 1180. J. L. Keck &amp; Brother, Cincinnati, Ohio, U. S.

## HOG—PICKLED MEATS, AND LARD.

*Report.*—1. The articles exhibited have developed the greatest care in preparation.

2. To an expert it is evident that the hogs from which the product on exhibition was made were superior and of the finest quality.
  3. The curing, packing, and general condition of the pickled meats, as also the consistency, color, and quality of the lard exhibited by this firm, are of the very best quality, and not only suggestive of enlarged experience in their production, but merit in competition the highest consideration.
- 

## 1181. Libby, McNeill, &amp; Libby, Chicago, Ill., U. S.

## CANNED CORNED BEEF AND TONGUE.

*Report.*—1. It is manufactured at the large establishment of the exhibitors in Chicago, under a patent issued at Washington, out of beef and tongues from the finest quality of cattle that can be procured.

2. Great care seems to have been evinced in preparation, viz., in boiling, seasoning, removing bone, canning, pressing, etc., resulting in the production of a most palatable article, as proven upon examination, and which is economical, convenient, and desirable for household purposes, and which warrants its recommendation for most favorable consideration and award and as having no superior in competition.
- 

## 1182. Portland Packing Co., Portland, Me., U. S.

## PRESERVED MEATS AND VEGETABLES.

*Report.*—Commended for the good quality of canned soups.

---

## 1183. George Cassard, Baltimore, Md., U. S.

## HAMS.

*Report.*—The meat is perfectly preserved with much less than the usual amount of salt, thus leaving the flesh moist and palatable.

---

## 1184. S. Davis, Jr., &amp; Co., Cincinnati, Ohio, U. S.

## HAMS OF CURED PORK.

*Report.*—Commended for the following reasons:

1. The excellent flavor of the meat.
  2. Its good keeping quality, demonstrated by the perfect freshness of hams cured in the winter of 1873.
- 

## 1185. Charles Jacob, Jr., &amp; Co., Cincinnati, Ohio, U. S.

## SUGAR-CURED HAMS.

*Report.*—The hams are sufficiently salted and smoked to insure their preservation, and yet retain to a great degree the flavor and moisture of the fresh ham.

**1186. Burnham & Morrill, Portland, Me., U. S.****CANNED MEATS—ROAST BEEF, MUTTON, VEAL, AND FOWL.**

*Report.*—It is neither overcooked nor too highly seasoned, and therefore retains fully the original appearance and taste of the several kinds of flesh.

**1187. Evans, Lipincot, & Cunningham, Cincinnati, Ohio, U. S.****CANVASED HAMS.**

*Report.*—The flesh retains in a high degree the original flavor of the pork, and is in a good state of preservation.

**1188. Black & Krebs, Baltimore, Md., U. S.****BACON AND HAMS.**

*Report.*—The meat is well cured and carefully put up, and is of good flavor.

**1189. P. T. George & Co., Baltimore, Md., U. S.****CANVASED HAMS.**

*Report.*—The meat is well cured, and retains the original flavor of the pork in a high degree.

**1190. Richardson & Robbins, Dover, Del., U. S.****BONELESS COOKED HAMS.**

*Report.*—Commended for the following reasons:

1. Novelty in the mode of preparation, to wit: the ham is boiled, the skin removed, and the bone extracted; it is then placed in a can adapted to the shape of the ham, and the space around it filled with jelly and the can closed at a boiling temperature.
2. The meat is not broken down, but retains its form and flavor, and is ready for use without preparation.

**1191. James Morrison & Co., Cincinnati, Ohio, U. S.****CANVASED HAMS.**

*Report.*—Commended for, 1, the attractive style of the exhibit; 2, the good quality and excellent preservation of the meat.

**1192. Western Meat Preserving Co. (Limited), Colac, Victoria, Australia.****PRESERVED MEATS AND SOUPS.**

*Report.*—Commended for the following reasons:

1. Careful preservation.
2. Variety.
3. Freshness of taste.

**1193. Melbourne Preserving Co., Maribyrnong, Salt Water River, Victoria, Australia.****PRESERVED MEATS AND SOUPS IN CANS.**

*Report.*—Commended for the following reasons:

1. Great care in cooking and packing.
2. Excellent flavor.
3. Freshness of taste and excellent preservation.
4. Great variety.

**1194. Sydney Meat Preserving Co., Sydney, New South Wales, Australia.****PRESERVED MEATS.**

*Report.*—The ox-tongue and boiled beef are carefully put up, well preserved, and of good taste.

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**1195. Christian Netz, Halifax, Nova Scotia.****BOLOGNA PRESERVED IN LARD.**

*Report.*—Commended for the following reasons:

1. Good taste.
  2. Good preservation.
- 

**1196. W. Woodrell, Halifax, Nova Scotia.****MESS BEEF.**

*Report.*—The meat is carefully packed, and is in an excellent state of preservation.

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**1197. Canadian Meat and Produce Co., Sherbrooke, Canada.****CANNED MEATS IN GREAT VARIETY.**

*Report.*—Commended for the following reasons:

1. The great variety exhibited, to wit: ox-tongue, whole, in can; game pie, in can; roast chicken, whole, in can; roast duck, whole, in can; roast veal, venison, and beef, in cans; pork truffles, in cans; sausages, in cans.
  2. The uniform good quality of the meats exhibited.
- 

**1198. J. D. Brian, Restigouche, New Brunswick.****CANNED ROAST BEEF.**

*Report.*—Commended for the excellent preservation of the peculiar flavor of the fresh beef.

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**1199. Christian Netz, Halifax, Nova Scotia.****SMOKED GOOSE, HAM, OX-TONGUE, AND SAUSAGE.**

*Report.*—Commended for the following reasons:

1. Novelty and variety of the exhibit.
  2. Good quality of meat.
- 

**1200. E. Caswell, Ingersoll, Ontario, Canada.****CURED HAMS AND BACON.**

*Report.*—A superior manner of curing, which secures long keeping and the finest flavor.

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**1201. E. Caswell, Ingersoll, Ontario, Canada.****HAMS, BREAKFAST BACON, SMOKE-DRIED SIDES, AND PRIME MESS PORK.**

*Report.*—Commended for the following reasons:

1. The excellent state of preservation in which all the articles were found.
  2. The fine flavor and color of the meat.
- 

**1202. Otto Niuberg, Tavaagus, Finland, Russia.****REINDEER STEAK AND WILD FOWL, CANNED.**

*Report.*—Commended for the following reasons:

1. Novelty.
2. Careful preparation of the product, and good state of preservation.

## 1203. Charles Mangold, St. Petersburg, Russia.

## CANNED BEEF; NAVAL STORES.

*Report.*—The beef was found in an excellent state of preservation, one sample being preserved without the use of salt, but showed no tendency to decomposition.

## 1204. A. Reignard, Paris, France.

## PATÉS DE FOIE GRAS, TRUFFLED.

*Report.*—Very fine "pâtés de foie gras," called "bouchées à la reine;" delicious taste; careful preparation.

## 1205. Caillebotte &amp; Dumagnon, Paris, France.

## PRESERVED MEATS, IN CANS.

*Report.*—His sausages preserved in their own gravy, and the calf's head, are very well preserved. The taste is delicious and the freshness perfect.

## 1206. Tivollier, Toulouse, France.

## PATÉ DE FOIE DE CANARD AUX TRUFFES.

*Report.*—An excellent product, put up with as much taste as care, and beautifully flavored with truffles; in good preservation.

## 1207. F. Lamarche, Paris, France.

## TERRINES DE FOIE GRAS WITH TRUFFLES (MARK "LOUIS").

*Report.*—This product is put up most elegantly, and is very tastefully and perfectly preserved.

## 1208. A. Dione, Paris, France.

## TRUFFLED GOOSE-LIVER PIES IN TIN BOXES, AND PRESERVED VEGETABLES.

*Report.*—The pies are put up with great care, perfectly preserved and of delicious flavor. The vegetables are very well kept and prepared for exportation. Their flavor, color, and appearance are excellent.

## 1209. Alphonse Biardot, Paris, France.

## PRESERVED MEATS, FRUITS PRESERVED IN SYRUP, PRESERVED VEGETABLES; CHOCOLATE.

*Report.*—The preserved meats are put up with the greatest care, very well preserved, and deliciously perfumed with truffles; the fruits in syrup have excellent flavor, the fresh taste of the fruit, and of the syrup; the vegetables are commended for freshness of taste, good color, and the care with which they are put up; the chocolate is very good, in which pure cacao and sugar are used, and is of remarkable cheapness.

## 1210. J. Vernis, Vich, Spain.

## SAUSAGE, IMITATION OF BOLOGNA.

*Report.*—Good-conditioned sausage, of fine flavor and very cheap.

## 1211. J. de Sande, Garrovillos, Chovisos, Spain.

## SAUSAGE MEAT FOR SOUP.

*Report.*—Meat well seasoned and kept in very good condition; greatly used in Spain, where it is a specialty.

**1212. Christiania Preserving Co., Christiania, Norway.**

CANNED MEAT, TO WIT: OX CARBONADE, MUTTON CUTLETS, AND BEEF SOUP.

*Report.*—Commended for the excellent preservation of the original flavor of the several kinds of flesh in the collection.

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**1213. Romero & Ferrin, Coruña, Spain.**

PRESERVED MEATS.

*Report.*—Fillet of pork with olive oil and garlic, and veal tongue with tomatoes; well preserved as to taste and condition.

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**1214. Garcia & Piñon, Coruña, Spain.**

PRESERVED MEATS.

*Report.*—The chicken, partridge, and veal tongue canned with olive oil are well preserved as to taste, etc.

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**1215. Miguel Cotofo, Coruña, Spain.**

PRESERVED MEATS.

*Report.*—Commended for good preservation of partridge in olive oil.

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**1216. Provincial Board of Agriculture of Cangas de Tineo, Oviedo, Spain.**

HAM.

*Report.*—Well-preserved ham, of fine taste, good quality, and in excellent condition.

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**1217. Provincial Commission of Lugo, Spain.**

SMOKED HAM.

*Report.*—Very good, of fine flavor, and kept in very good condition.

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**1218. E. Martin Carnes, Aracena, Huelva, Spain.**

SMOKED HAM.

*Report.*—Smoked ham, well preserved, of fine taste, and with a general good reputation.

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**1219. Maria do Carmo Bazilio, Arrouches, Portalegre, Portugal.**

PAIO (FRESH PORK PRESERVED IN LARD).

*Report.*—Good, and well preserved, notwithstanding the great heat and length of time it has been put up.

---

**1220. Municipality of Lisbon, Portugal.**

SAUSAGE MEMBRANES.

*Report.*—These sausage membranes are prepared with heated water, 25° Centigrade. They are very strong, and the process appears eminently effective.

---

**1221. Luiz Marques Pinto, Villa Boim, Elvas, Portalegre, Portugal.**

PAIO (PORK PRESERVED IN LARD).

*Report.*—Good, considering the difficulties of the heat, the distance it came, and the length of time it has been put up.



**1222. Fernando Rodriguez & Nephew, Lisbon, Portugal.**

PRESERVED MEATS, CANNED.

*Report.*—A fine collection of preserved meats, well cooked, well flavored, and well preserved.

---

**1223. Joaquim Marques Pinto, Villa Boim, Elvas, Portalegre, Portugal.**

PAIO (PORK PRESERVED IN LARD).

*Report.*—His paio (fillet of pork preserved in lard, in membrane, resembling in shape a sausage) is one of the national productions of Portugal, and was very well preserved.

---

**1224. Leal, Costa, & Co., Lisbon, Portugal.**

PRESERVED MEATS (CANNED).

*Report.*—A good collection of preserved meats of different kinds; fresh and well flavored.

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**1225. Varzea & Coelho, Oporto, Portugal.**

PRESERVED MEATS (CANNED).

*Report.*—A fine collection of meats and soups, very well preserved, well flavored and fresh.

---

**1226. Jose Antonio d'Oliveira & Co., Lisbon, Portugal.**

PRESERVED MEATS, VEGETABLES, AND DRIED FRUITS.

*Report.*—Canned meats very well prepared and preserved, firm, fresh, and of good flavor and appearance.

Preserved vegetables, which recommend themselves for freshness and flavor.

Fruits canned, bottled, and dried in sugar, of good appearance and preservation.

---

**1227. Gaetano Samoggia & Brothers, Bologna, Italy.**

MORTADELLA, SLICED AND CANNED.

*Report.*—Commended for the following reasons:

1. The excellent quality of the meat.
  2. The convenient form in which the article is put into the market.
- 

**1228. Raphael Orsi, Bologna, Italy.**

SAUSAGE, CANNED AND IN MEMBRANES COVERED WITH TIN FOIL.

*Report.*—Commended for the careful manner in which the work is done, and the perfect preservation of the meat.

---

**1229. Zappoli Brothers, Bologna, Italy.**

PORK SAUSAGE, PRESSED AND COVERED WITH TIN FOIL.

*Report.*—Commended for the following reasons:

1. Well prepared and seasoned.
  2. The meat preserves the original flavor.
  3. Ready for the table, without preparation.
- 

**1230. Giuseppe Fugeri, Modena, Italy.**

BACON, HAM, COOKED IN MEMBRANES, AND UNCOOKED.

*Report.*—Commended for its excellent preservation and good flavor.

## 1231. Guido Zanetti, Bologna, Italy.

PORK SAUSAGES IN MEMBRANES, COOKED, SLICED, AND IN CANS.

*Report.*—Commended for the following reasons:

1. The excellent quality of the goods.
  2. The convenient and artistic style in which they are put up.
- 

## 1232. Giovanni Ziroui, Fiorano, Italy.

TWO SPECIMENS OF SAUSAGE, ONE DRIED, THE OTHER FRESH.

*Report.*—Commended for the following reasons:

1. The care and skill exhibited in its preparation and seasoning.
  2. Its high flavor and good state of preservation.
- 

## 1233. Molinari Brothers, Modena, Italy.

PORK, SALTED AND SMOKED, COOKED, AND UNCOOKED, SLICED, AND PUT UP IN MEMBRANES.

*Report.*—Commended for the following reasons:

1. The careful manner in which the meat is put up.
  2. Its good keeping qualities.
- 

## 1234. Paolo Tacconi, Bologna, Italy.

MORTADELLA, PRESSED IN CANS.

*Report.*—Commended for the excellent state of preservation, and the convenient form in which the meat is exhibited.

## 1235. Lanzarini Brothers, Bologna, Italy.

PORK SAUSAGE PRESSED IN SQUARE TIN BOXES, AND IN MEMBRANES.

*Report.*—Commended for the following reasons:

1. Properly seasoned.
  2. Retains its original flavor in a high degree.
- 

## 1236. Grillini, Nanni, &amp; Co., Bologna, Italy.

PORK SAUSAGES.

*Report.*—Commended for the neat and convenient method of putting up the product, viz., the sausage is pressed, cooked, and sliced very thin, and put in tin cans soldered.

## 1237. Ulisse Colombine, Bologna, Italy.

PORK SAUSAGE, PRESSED AND PUT UP IN FIFTY-POUND PACKAGES.

*Report.*—Commended for the excellent state of preservation of the meat, and its fine flavor.

## 1238. David Carulli, Cremona, Italy.

PORK SAUSAGES UNCOOKED, PUT UP IN MEMBRANES AND COVERED WITH TIN FOIL, AIR-TIGHT.

*Report.*—Commended for the following reasons:

1. The good quality and fine flavor of the meat.
2. The novel forms in which it was put up (one package was ten feet long and weighed fifty pounds).

**1239. Giuseppe Bellentani, Modena, Italy.**

MORTADELLA IN THIRTY-POUND PACKAGES IN TIN FOIL; SLICED HAM IN MEMBRANES

*Report.*—Commended for the following reasons :

1. Good quality of the product.
  2. Its cheapness.
- 

**1240. Filippo Stiassi, Bologna, Italy.**

PORK SAUSAGE IN MEMBRANES DRIED, ALSO IN SOLDERED TIN CANS.

*Report.*—The preparation is faithfully made, and thoroughly cured so as to keep in all climates.

---

**1241. Bordini, Natale, & Co., Bologna, Italy.**

PORK SAUSAGE IN MEMBRANE, DRIED, AND ALSO IN CANS.

*Report.*—Commended for its good state of preservation, and its convenience for excursions and voyages.

---

**1242. Giuseppe Romagnoli, Felsinea, Bologna, Italy.**

PORK SAUSAGE, HERMETICALLY SEALED IN TIN BOXES, AND THE SAME IN MEMBRANES, COVERED WITH TIN FOIL.

*Report.*—Commended for the following reasons :

1. The perfect preservation of the meat and its proper seasoning.
  2. The convenience of the packages, for journeys and excursions.
- 

**1243. Nicolo Massardo, Sanpierdarena, Genoa, Italy.**

PRESERVED MEATS.

*Report.*—1. Cauliflowers stuffed with meat, stewed beef, roast veal, put up in tin cans, carefully preserved.

2. Very good taste after two years' preservation in cans.
- 

**1244. Prof. Alexander Hersen, Florence, Italy.**

PRESERVED RAW MEAT.

*Report.*—Commended for good preservation, natural flavor, and as well prepared for long voyages. This specimen has made two long voyages.

---

**1245. M. & U. Bassi Brothers, Bologna, Italy.**

PORK HAMS COOKED, SLICED, AND IN CANS.

*Report.*—Commended for the following reasons :

1. The good quality of the meat.
  2. Its convenient form for immediate use.
- 

**1246. Alessandro Forni, Bologna, Italy.**

PORK HAM CURED, SLICED, AND PRESSED IN CANS.

*Report.*—Commended for the following reasons :

1. Novelty in the manner of putting up the goods.
2. Convenience for immediate use.

## 1247. Widow J. W. Suric, Son, &amp; Co., Rotterdam, Netherlands.

## PRESERVED MEATS, PRESERVED VEGETABLES, AND PICKLES.

*Report.*—A great variety of meats well preserved, of good flavor and appearance, and put up with great care; great variety of vegetables well preserved, of good taste and appearance, and well put up; pickles with natural color well preserved in fine quality of vinegar.

---

## 1248. J. H. Nieuwenhuijs, Jr., &amp; Co., Amsterdam, Netherlands.

## PRESERVED MEATS, PRESERVED VEGETABLES, AND PICKLES.

*Report.*—Preserved meats carefully put up and of excellent flavor and appearance; also extracts of meat of extraordinary quality; vegetables perfectly prepared, of excellent quality, and well put up; and pickles of excellent taste, beautiful preservation of natural color, in vinegar of superior quality.

---

## 1249. Stavanger Preserving Co., Stavanger, Norway.

## COLLECTION OF CANNED MEATS.

*Report.*—Commended for the extent, variety, and uniform good state of preservation of the articles exhibited, to wit: black grouse, ptarmigan, meat balls, and sirloin.

---

## 1250. Chr. Augustus Thorne, Moss, Norway.

## CANNED MEAT, TO WIT: HJERPE, GROUSE, AND SAUSAGE.

*Report.*—Commended for the substantial manner in which the articles are put up to serve as naval stores on long voyages.

---

## 1251. Z. Vikström, Stockholm, Sweden.

## A COLLECTION OF CANNED MEATS.

*Report.*—Commended for the following reasons:

1. The great variety of the exhibit, to wit: roast turkey, pork sausage, hjerpe (quail), goose, reindeer sirloin, chicken, fricadella (meat pulp), pork cutlets, veal sirloin, beef à la mode, and veal cutlets.
  2. The uniform good quality and excellent state of preservation in which the meats were presented.
- 

## 1252. Selim Agha, Yanina, Turkey.

## ESSENCE OF CEDRAT.

*Report.*—Essence of cedrat, pure, well flavored, and distilled.

---

## 1253. Theophani, Crete, Turkey.

## ESSENCE OF ORANGE FLOWERS.

*Report.*—Of good bouquet and superior distillation.

---

## 1254. Lazar Brothers, Königsberg, Germany.

## FRUIT EXTRACTS.

*Report.*—A strong syrup of raspberries, showing in perfection the flavor of the fruit.

## 1255. I. Calvin Shafer, New York, N. Y., U. S.

## RASPBERRY SYRUP.

*Report.*—Commended for good taste, fine fruit flavor; is one of the choicest syrups.

---

## 1256. Barrett &amp; Co., Sydney, New South Wales, Australia.

## SYRUPS AND EXTRACTS.

*Report.*—Commended for careful preparation, natural taste, and good condition.

---

## 1257. Emile Déjardin, Paris, France.

## SYRUP OF MALTESE ORANGE.

*Report.*—The taste of the syrup of Maltese orange is delicious. The syrup is wonderfully clear and light and very cheap.

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## 1258. Nicholas Lanin, Moscow, Russia.

## SODA WATERS.

*Report.*—A very good beverage made with soda water and pine-apple, cherry, or raspberry syrups, nicely flavored.

---

## 1259. Nicholas Lanin, Moscow, Russia.

## JUICE OF FRUITS AND SYRUPS.

*Report.*—A fine and varied collection of fruit juice and syrups, with an excellent flavor, fine color, and much freshness.

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## 1260. Ohannes, Diarbekir, Asia Minor.

## SYRUP.

*Report.*—Very good specimen of syrups made with grapes; nice flavor and carefully prepared.

---

## 1261. Della Sudda (feyk Pacha), Constantinople, Turkey.

## SYRUPS.

*Report.*—A first-rate selection of syrups made from different kinds of fruit; remarkable as to quality and cheapness.

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## 1262. Francis Isidore Duos, Rio de Janeiro, Brazil.

## SYRUP.

*Report.*—Commended for the good quality of a plain syrup called "liquor of raw sugar," filtered.

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## 1263. Braga Brothers &amp; Co., Rio de Janeiro, Brazil.

## FRUIT SYRUPS.

*Report.*—Commended for the good quality and rich flavor of their syrups, gomma and grosellha.

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## 1264. Otto Freygang, Colony Blumenau, Brazil.

## FRUIT SYRUP.

*Report.*—Commended for the very good quality of his syrup grosellha.

## 1265. Henry Reed &amp; Co., South Yarra, Victoria, Australia.

## RASPBERRY VINEGAR AND LIME-JUICE CORDIAL.

*Report.*—Commended for strength of natural flavor, and purity of material used, as well as good quality.

---

## 1266. Sheiermann &amp; Co., Riga, Russia.

## VINEGAR.

*Report.*—A strong vinegar, of good aroma.

---

## 1267. Buck Brothers, Lübeck, Germany.

## VINEGAR.

*Report.*—Commended for great acidity, superior quality, and high flavor.

---

## 1268. Th. Moskopf, Fahr, Germany.

## VINEGAR AND MUSTARD.

*Report.*—Commended for excellent quality of vinegar and mustard, carefully put up and composed.

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## 1269. Konigstadtler Brothers, Neusatz, Austria.

## VINEGAR SPIRIT.

*Report.*—Commended for the great strength and high quality.

---

## 1270. F. Schlick, New York, N. Y., U. S.

## BOTTLE WASHER.

*Report.*—A good mechanical contrivance.

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## 1271. K. Hutter, New York, N. Y., U. S.

## PATENT LIGHTNING BOTTLE STOPPER.

*Report.*—Commended for utility, simplicity, and facility of application.

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## 1272. H. Weinhausen, New York, N. Y., U. S.

## WINE TESTING APPARATUS.

*Report.*—Commended for utility and good workmanship.

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## 1273. E. Gervais, Bordeaux, France.

## CORKING MACHINES.

*Report.*—Useful and good corking machines.

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## 1274. Widow Maurice &amp; Guenin, Epernay, France.

## CORKING MACHINES.

*Report.*—No. 1.—Champagne wine bottles; corking machines, with wood mallet.  
2. Ditto, self-acting.

The cork is driven in the bottle with equal pressure on both sides.

## 1275. Fréal, Epernay, France.

## BOTTLING MACHINE.

*Report.*—This machine bottles with great celerity, regularity, and without any loss of liquid, with great economy in labor-expense.

## 1276. Appert-Mandart, Reims, France.

## WINE PRESS.

*Report.*—Commended for rapidity combined with great power in this system of press, and consequently great saving of labor.

## 1277. De Mestre, Bordeaux, France.

## MACHINERY FOR WINE PURPOSES.

*Report.*—Machines for corking and capsuling bottles.  
Very simple; of good design, and cheap.

## 1278. Thirion, Reims, France.

## MACHINERY FOR WINES.

*Report.*—A new patent clasp for securing sparkling wines from leakage, requiring no instrument for uncorking, and is instantly unfastened by pulling the suspended gun outwards. A very simple invention, very valuable to all sparkling wine shippers.

## 1279. Renard Laprime, Epernay, France.

## FASTENING FOR WINE BOTTLES.

*Report.*—A string used for securing the cork on champagne wine bottles. Commended for quality and fitness, strength and polish.

## 1280. Lejeune-Oroy, Epernay, France.

## MACHINE FOR BOTTLING CHAMPAGNE.

*Report.*—This machine works in a regular and perfect manner; a very ingenious system.

## 1281. A. Tricourt, Reims, France.

## MACHINES FOR BOTTLING WINES.

*Report.*—Machine for bottling champagne wines. Machine for filling six bottles at the same time. Commended for originality in adaptation, utility, quality, and simplicity.

## 1282. Alphonse Lavy, Epernay, France.

## MACHINE FOR BOTTLING PURPOSES.

*Report.*—Two metal funnels with valves for filling up to the corks and preventing loss of liquid; good system.

## 1283. L. Pean, Epernay, France.

## MACHINE FOR BOTTLING WINES.

*Report.*—A machine for clamping the cork on champagne wine bottles. Commended for fitness and economy in labor.

The iron clasps employed in lieu of strings or wires are cheap and solid. Also for a mechanical safety corkscrew, intended to draw off the broken corks from the bottles, which works very well.

**1284. Boomer & Boschert, Syracuse, N. Y., U. S.**

ONE POWER CIDER PRESS, ONE HAND CIDER PRESS, AND ONE WINE PRESS.

*Report.*—Commended for the following reasons:

1. The correct philosophic design of the presses.
  2. The good material and excellent workmanship used in their construction.
  3. The great power capable of being exerted by the peculiar mechanical combination employed.
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**1285. Department of Vine Culture of the Agricultural Association of Rhine Hesse, Grand Duchy of Hesse, Germany.**

MAP OF THE WINE-PRODUCING DISTRICT OF HESSEN.

*Report.*—Commended for the very correct drawing, the practical composition, and usefulness of the map, showing all the vineyards of the district.**1286. Dr. A. Blankenhorn, Karlsruhe, Baden, Germany.**

TREATISES ON THE CULTURE OF THE VINE.

*Report.*—Commended for the undoubted merit of his publications, which contributed so greatly to the improvement of German vine culture.**1287. G. J. Burkhardt & Co., Philadelphia, Pa., U. S.**

STORAGE VATS, MASH TUBS, AND TUNS.

*Report.*—Commended for selection of material and good workmanship; also for improved arrangement of discharge valves for mash tubs for brewers' purposes.**1288. August Wohlfarth, Williamsburg, Long Island, N. Y., U. S.**

AIR AND ROTARY BEER PUMPS AND FAUCETS.

*Report.*—The pumps are of good design, embodying sound scientific principles, and the mechanical execution of the work, including both material and finish, can scarcely be excelled. The faucets and couplings are of the same excellent workmanship.**1289. J. Trageser, New York, N. Y., U. S.**

BREWERS' COPPER UTENSILS.

*Report.*—The specimens of work exhibited, consisting mainly of Harris's self-acting mashing machine, large copper cooling pipes with brass couplings and a copper bottom, of extraordinary size, show the highest degree of mechanical skill in the handling and finishing of the materials employed, furnishing a product of unexceptionable utility and excellence.**1290. Ernest J. Bauer, Brooklyn, N. Y., U. S.**

RACKING HOSE.

*Report.*—Commended for utility and adaptability to the purpose.**1291. John D. Seagrave, Worcester, Mass., U. S.**

STOPPLE FAUCET.

*Report.*—Commended for ingenuity and economy of construction.



1292. John Decker & Son, Philadelphia, Pa., U. S.

BEER SWIMMERS, WATERING POTS, AND STOCK SIEVE.

*Report.*—Commended for good workmanship.

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1293. A. G. Hupfel, New York, N. Y., U. S.

CASK-ROLLING MACHINE.

*Report.*—Commended for utility and adaptability to its purpose.

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1294. Niagara Steam Pump Works, Brooklyn, N. Y., U. S.

AIR COMPRESSOR (DUPLEX).

*Report.*—The best air compressor for brewers' use.

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1295. J. Schwarzwald & Son, New York, N. Y., U. S.

BEER CASK AND KEGS.

*Report.*—Commended for good workmanship and selection of materials.

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1296. G. B. Cornell, Chicago, Ill., U. S.

PATENT SCREW BUSH AND WRENCH FOR BEER BARRELS.

*Report.*—Commended for utility and facility of application.

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1297. H. Steubing, New York, N. Y., U. S.

ICE SWIMMER FOR BEER.

*Report.*—Commended for good workmanship.

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1298. Charles Stoll, Brooklyn, N. Y., U. S.

MALT MILL WITH DOUBLE SCREEN, SCALE HOPPER, MALT SCOURER AND POLISHER; A  
MODEL FOR STEAM BREWERY.

*Report.*—Commended for improvement in mechanical arrangement and construction of malt mill, screen, scale hopper, and malt scourer; also for an improved model in the arrangement of machinery and fixtures of a brewery.

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1299. August Roos, New York, N. Y., U. S.

COOLING APPARATUS FOR BEER.

*Report.*—A decided improvement.

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1300. John Schafhaus, New York, N. Y., U. S.

SELF-ACTING MASHING APPARATUS.

*Report.*—Commended for effectiveness of action, novelty of construction, and fine workmanship.

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1301. Union Hardware Co., New York, N. Y., U. S.

BEER COOLER.

*Report.*—Commended for novelty of construction and adaptability to the purpose.

**1302. Trottman & Ott, Philadelphia, Pa., U. S.**

BEER COOLER AND SELF-ACTING MASHING MACHINE.

*Report.*—Commended for good workmanship.**1303. Peter Gerlach & Co., Cleveland, Ohio, U. S.**

PITCHING MACHINE FOR CASKS.

*Report.*—Commended for simplicity of construction, economy of space, and effectiveness of operation.**1304. Edward Haas, Philadelphia, Pa., U. S.**

SEPARATOR AND MALT SCOURER, SCALE AND HOPPER, SAWING AND SHAVING MACHINE.

*Report.*—Commended for good workmanship and mechanical arrangement.**1305. William Orth & Co., New York, N. Y., U. S.**

BREWERS' STEAM COPPER KETTLE; UNDERBACK FOR MASH-TUB AND PIPING.

*Report.*—Commended for good workmanship and ingenious mechanical arrangement.**1306. F. Fiederlein, New York, N. Y., U. S.**

BREWERS' MASHING MACHINE.

*Report.*—The best rotary mashing machine on exhibition.**1307. Ernest J. Bauer, Brooklyn, N. Y., U. S.**

WOOD AND IRON VARNISH.

*Report.*—Of good quality, and specially adapted to brewers' purposes.**1308. G. F. Blake Manufacturing Co., Boston, Mass., U. S.**

STEAM PUMP FOR BREWERS' USE.

*Report.*—Commended for construction and arrangement of brewers' mash pump.**1309. John M. Smith & Son, Philadelphia, Pa., U. S.**

CEDAR MASH TUB, IMPROVED STEEP TUB AND DISCHARGE VALVE.

*Report.*—Commended for selection of material and good workmanship; also for improvements in the construction of steep tubs for maltsters' purposes.**1310. John Martin Otto, Brooklyn, N. Y., U. S.**

SURFACE COOLER, SWIMMER, AND CORK BASKET.

*Report.*—Commended for good workmanship in the construction of the surface cooler, and ingenious and simple arrangement for adjusting the level of the same; also for an ingenious and useful cork basket.**1311. Iron Clad Can Co., New York, N. Y., U. S.**

APPARATUS FOR PRESERVING MALT LIQUORS ON DRAUGHT.

*Report.*—The best mechanical arrangement for successful application of carbonic acid gas for preserving malt liquors on draught, now in use.

**1312. John G. White & Co., New York, N. Y., U. S.****MODEL OF MALT HOUSE.**

*Report.*—Commended for the economical arrangement of the house, with the application of superheated steam for drying purposes.

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**1313. Stephen Kampf, Albany, N. Y., U. S.****MALT SHOVELS.**

*Report.*—Commended for good workmanship and adaptation to the purpose.

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**1314. C. Dierlinger, Cincinnati, Ohio, U. S.****LAGER BEER CASKS.**

*Report.*—Commended for good workmanship and selection of materials; also for the successful construction of very large casks.

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**1315. W. W. Hughes & Sons, Philadelphia, Pa., U. S.****MALT KILN, SHOWING THREE STYLES OF FLOORING, COPPER AND IRON FALSE BOTTOMS FOR MASH AND HOP TUBS.**

*Report.*—The simplest arrangement of kilns, with the malting floor, now in use; commended for the arrangement of the mash-tub bottoms with the tub; together with good workmanship.

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**1316. Theo. Bergner, Philadelphia, Pa., U. S.****IMPROVED MALT KILN, WITH WIRE FLOOR AND MECHANICAL MALT TURNER.**

*Report.*—Commended for wire flooring and malt turner; for their certainty and effectiveness of action; and also for the novel and ingenious mechanical arrangement for operating the malt turner.

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**1317. Kirby Bung Manufacturing Co., Cincinnati, Ohio, U. S.****BUNG MAKING MACHINE AND BUNGS.**

*Report.*—Commended for a most ingenious machine for manufacturing bungs, in use; also for the superiority of the bungs manufactured.

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**1318. Theo. Bergner, Philadelphia, Pa., U. S.****IMPROVED RACKING VALVE AND TAPPING INSTRUMENT FOR BEER CASKS.**

*Report.*—Excellent in every respect.

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**1319. Martin Schmahl, New York, N. Y., U. S.****MASHING APPARATUS.**

*Report.*—Commended for good workmanship.

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**1320. G. Schock, New York, N. Y., U. S.****BARREL WASHING MACHINE.**

*Report.*—An improved barrel washing machine.

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**1321. Louis Saal, New York, N. Y., U. S.****TOP WHITE BEER WAGON.**

*Report.*—Commended for good workmanship.

**1322. A. Zoller, Hoboken, N. J., U. S.****BARREL RINSER; RACKING VALVES; TAPPING APPARATUS.**

*Report.*—Commended for utility and convenience of purpose, also for good workmanship.

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**1323. Francis S. Kinney, New York, N. Y., U. S.****A MACHINE FOR CUTTING TOBACCO.**

*Report.*—The machine exhibited is admirably well adapted to the purpose of cutting tobacco for smoking in the pipe, and for cigarettes, as well as for chewing. It is capable of graduation to cut as fine as a hair up to one-quarter of an inch in size. Its capacity under power is about twelve hundred pounds per day. The true principles of mechanics have been observed in its construction. The gearing is simple and imparts to the knife both vertical and horizontal motion, thus securing as the resultant a sliding motion to the edge which effects a clean smooth cut. The feed being automatic, perfect uniformity in the product is obtained.

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**1324. H. Wulstein, New York, N. Y., U. S.****TOBACCO GRANULATING MACHINES.**

*Report.*—Commended because of the substantial and durable character of the “granulator;” the efficiency, uniformity, and speed with which it converts dry leaf into granulated smoking tobacco; and the moderate price at which the machine is sold to the trade.

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**1325. J. E. H. Andrew, Stockport, England.****TOBACCO SPINNING MACHINE.**

*Report.*—This machine is exceedingly ingenious in its combinations of motion adapted to the rather difficult operation of spinning leaf tobacco into beautiful rolls many feet in length and uniform in size and twist. The mechanical construction of this machine is creditable to the inventor and the mechanics who finished it. In the peculiar form of tobacco manufacturing adopted in some countries, this machine must effect a great saving of labor.

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**1326. D. H. Hull, Syracuse, N. Y., U. S.****TOBACCO STEMMING MACHINE.**

*Report.*—Commended for the simplicity and efficiency of the machine in taking out the large central stem from leaf tobacco without tearing the fibre, thus leaving it in the best form for cigar wrappers and effecting a considerable saving from waste in the tips of the leaves. The construction is simple, and the working of the machine is most satisfactory.

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**1327. P. O. Cain & Co., Philadelphia, Pa., U. S.****CIGAR MOULDS.**

*Report.*—These moulds are most substantially and accurately made, of prepared beech wood, and are useful in securing perfect uniformity in the size and shape of cigars made in them; a very desirable result in the grades of cigars usually made from American tobacco.

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**1328. David H. Hull, Syracuse, N. Y., U. S.****TOBACCO STRIPPER.**

*Report.*—It is an ingenious, novel, and economical machine, by which the work of stripping tobacco is done much more rapidly than by the hand process, at less cost, and with considerable saving of stock.

## 1329. Osenbruck &amp; Co., Hemelingen, Germany.

## CIGAR MOULDS.

*Report.*—The cigar moulds of prepared beech-wood are very well made and of good material.

## 1330. D. W. Garst, Washington, D. C., U. S.

## MACHINE FOR SLICING DRIED BEEF.

*Report.*—Commended for its convenience in reducing dried beef to slices of uniform thickness and as thin as desired, and for the rapidity with which it does its work.

## 1331. Kenyon Brothers, Raritan, N. J., U. S.

## SIX MEAT CHOPPERS (ONE POWER, ONE EXCHANGEABLE, AND FOUR HAND).

*Report.*—Commended for the variety and good finish of the machinery and its compactness and light running qualities.

## 1332. Bailey Wringing Machine Co., New York, N. Y., U. S.

## SEVEN SIZES OF HAND-WORKING MEAT AND VEGETABLE CHOPPERS.

*Report.*—A convenient and cheap machine for various kitchen uses, simple, easily operated and cleaned, and not likely to get out of order.

## 1333. August Nittinger, Jr., Philadelphia, Pa., U. S.

## A COLLECTION OF BUTCHERS' TOOLS, MEAT CHOPPERS, AND SAUSAGE STUFFERS.

*Report.*—Commended for:

1. The extent of the machinery exhibited, to wit: eight power and hand meat choppers of different sizes, of good material and finish; four sausage stuffers of different dimensions and capacities, with new and very ingenious backward movement and spring latch that holds the cylinder in an upright position in order to fill it with the chopped meat.
2. The good arrangement and permanent construction of the machinery and its excellent adaptation to the work for which it is designed.

## 1334. Murray Iron Works Co., Burlington, Iowa, U. S.

## ONE POWER AND TWO HAND DRAW-CUT MEAT CHOPPERS.

*Report.*—The stroke of the knives has a drawing motion, which gives advantage in cutting.

## 1335. Rankin Manufacturing Co., Pittsburg, Pa., U. S.

## THREE MEAT CHOPPERS, POWER AND HAND SIZES.

*Report.*—Commended for the following reasons:

1. The knives are placed at different angles, so that no two of them cut in the same line.
2. The meat may be removed and the machine recharged while in motion.

## 1336. J. Pernollet, Paris, France.

## SORTERS FOR COFFEE, SEEDS, ETC.

*Report.*—No. 1. Pernollet's riddle sorters, with fixed compartments. For cleaning seed, corn, wheat, rye, etc.

No. 2. Pernollet's riddle sorters with movable compartments.

No. 3. Separating riddle sorters for cocoa, coffee, etc.

No. 4. Separating riddle sorters with fan.

## No. 5. Alveolus sorter.

All these machines have been invented by the exhibitor; very ingenious and practical inventions, saving hand labor. They are principally used in industry for cleaning seed, corn, and to sort cocoa, coffee, and fresh-shelled peas.

Commended for excellence and cheapness in workmanship.

## 1337. E. Dagand, Paris, France.

## MACHINERY FOR MAKING COFFEE.

*Report.*—A large assortment of coffee pots, holding six cups, twenty-five cups, one hundred cups, five hundred cups, eight hundred cups, with boilers proportionate to the capacity of the coffee pots. A very economical process, saving hand labor, and suited to use in the army and navy.

## 1338. George Boyd, Philadelphia, Pa., U. S.

## AROMA COFFEE ROASTER.

*Report.*—The coffee in the machine never comes in contact with the gases, smoke, or any impurities, and the product obtained is good.

## 1339. George Boyd, Philadelphia, Pa., U. S.

## AROMA COFFEE COOLER.

*Report.*—This machine clears, cooks, and polishes the roasted coffee, receiving the coffee, and after treatment discharges directly into the bag or sack.

## 1340. A. Mondollet, Paris, France.

## MACHINERY FOR MAKING SODA WATER.

*Report.*—A large assortment of apparatus for making soda water in small or large quantities. Very handy system, covering a small space, of an easy use, with a solid boiler, built so that accidents or explosions cannot happen.

## 1341. H. Maldiné, Paris, France.

## APPARATUS FOR SODA WATER.

*Report.*—A very complete assortment of apparatus for making soda water; bottles of all sizes, nicely gotten up and obtainable at moderate figures.

## 1342. Guéret Brothers, Paris, France.

## APPARATUS FOR SODA WATER.

*Report.*—A large exhibit of apparatus for making soda water, and bottles of all sizes, made of good and strong glass, and cheap.

## 1343. Durafort, Paris, France.

## APPARATUS FOR BOTTLING SODA WATER.

*Report.*—The apparatus for bottling soda water called "siphons" are elegant, solid, and cheap.

**1344. D. Cazaubon, Paris, France.****MACHINERY FOR MAKING SODA WATER.**

*Report.*—A large assortment of apparatus for making soda water in small or large quantities. Good valves, brass and copper, worked up well. Pumps for dosing syrups amalgamated with soda water. Counter and machines for dosing syrups for bar-room purposes. All these inventions are ingenious and practical.

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**1345. G. Hermann, Paris, France.****MACHINES FOR CHOCOLATE.**

*Report.*—A complete collection of machines for making chocolate.

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**1346. Ch. J. B. Létang, Paris, France.****MOULD FOR CHOCOLATE AND BONBONS.**

*Report.*—Commended for good and careful manufacturing of fancy moulds for chocolate and bonbons.

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**1347. E. Denet, Paris, France.****MOULDS FOR VERMICELLI, MACARONI, AND PASTINES.**

*Report.*—Forms in copper for macaroni, vermicelli, and pastines, giving all sorts of fancy shapes for alimentary pastes. Commended for good and easy working.

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**1348. Giovanni Uliengo, Biella, Novara, Italy.****CHURN.**

*Report.*—A very ingenious invention for the making of butter. With this machine, people can save time, while not a drop of liquid is lost.

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**1349. Gilt Edge Butter Co., Cleveland, Ohio, U. S.****METALLIC LINED BUTTER PACKAGE (THE ADAMS PATENT).**

*Report.*—Commended for its superior capacity for preserving butter in long journeys and for a great length of time.

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**1350. E. Pelletier & A. Pallard, Paris, France.****MEAT BROTH AND VEGETABLES FOR SOUP, AND NEW CANS FOR PRESERVES.**

*Report.*—The meat broth and vegetables for soup combine in the smallest compass, and for wonderfully low prices, the greatest amount of nutritious matter, and are most useful for the army and navy. The new cans, for sardines and all sorts of preserves, are easily opened without a knife.

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**1351. Seeley & Stevens, New York, N. Y., U. S.****JEWELL'S SELF-OPENING CAN.**

*Report.*—This is an ingenious application, which allows of soldered cans being opened without the use of a knife or the destruction of the can. A fine but strong wire is introduced and soldered, the end being fastened outside. To undo the fastenings and pull out the wire, thereby cutting through the solder, is the work of a few seconds. The can is opened and is not impaired for future use. Adds only one cent to the cost, and doubles the utility.

**1352. Barau & Firmin Colas, Nantes, France.****TIN BOXES AND METALLIC LABELS FOR PRESERVES.**

*Report.*—A great collection of plain and printed tin boxes, for sardines and all preserves. Printed metallic labels for the same object; fancy and elegant work. Commended for solidity and cheapness.

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**1353. L. Migret & Co., Paris, France.****STOPPERS FOR BOTTLES, PRESERVE-POTS, CANS, ETC.**

*Report.*—This is a new mode of stopping bottles, pots, cans, etc., which dispenses with the cork (or only requires a small proportion); is simple, effective, and recommends itself likewise for the ease with which the stopper can be removed.

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**1354. Ingraham & Baerd, Chicago, Ill., U. S.****SEPARATOR AND GRADER FOR GRAINS.**

*Report.*—A valuable machine of great capacity for receiving, separating, and grading grain.

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**1355. Spittler & Lang, New York, N. Y., U. S.****SHAVINGS CUTTER.**

*Report.*—An improved shavings cutter.

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**1356. Chas. Woehrle, New York, N. Y., U. S.****ELEVATOR BUCKETS.**

*Report.*—Commended for selection of material and good workmanship.

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**1357. Geo. Mooney, New York, N. Y., U. S.****FELTING FOR ICE-HOUSES AND STEAM BOILERS.**

*Report.*—Commended for utility, economy, and effectiveness in its application to the purpose, together with selection of its material and good workmanship.

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**1358. Pratt, Read, & Co., Deep River, Conn., U. S.****NATIVE IVORY.**

*Report.*—Commended for the good quality of the material and variety of the exhibit, especially ivory veneer fifty feet long.

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**1359. John S. George, Nassau, Bahama Islands.****VEGETABLE WAX.**

*Report.*—A sample of myrtle wax; novel and useful in producing artificial light.

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**1360. Troja Alfeo, Syracuse, Italy.****SEA BREAD.**

*Report.*—Commended for its good quality and well-preserved condition.

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**1361. Agrarian Committee of Chiavari, Italy.****MACHINE FOR SULPHURIZING GRAPE-VINES AND OTHER FRUIT-BEARING TREES.**

*Report.*—An ingenious invention, skillfully constructed, and of great utility to preserve grape-vines and the fruits from the Oidium.



## 1362. Cafeodijidaki, Samos, Turkey.

ALCOHOL.

*Report.*—Very pure and exceedingly well distilled alcohol.

## 1363. Anselmi &amp; Marassi, Marigliano, Italy.

ALCOHOL.

*Report.*—Alcohol made from maize; very good, of high degree, and very cheap.

## 1364. J. C. van Marken, Jr., Director of the Netherland Yeast and Alcohol Manufactory, Delft, Netherlands.

ALCOHOL.

*Report.*—Very fine alcohol, obtained from cereals. Strength, 93.5 per cent. pure alcohol.

## 1365. Silvestre Ochagavia, Santiago, Chili.

WINES.

*Report.*—A fine, white, dry wine; and some very good red wine, of a flavor peculiar to the country, but not so predominant in this sample as to make it disagreeable.

## 1366. Warrenheip Distilling Co., Ballarat, Victoria, Australia.

SPIRITS.

*Report.*—Two samples of whisky one and two years old; very good distillation in Scotch style. Two samples of gin, also very good distillation; and one of spirits of wine, of fair quality.

## 1367. Parent Brothers, Barcelona, Spain.

SPIRITS.

*Report.*—"Aceite de Anis," a very good, finely-distilled, and delicately-flavored spirit.

## 1368. Raimundo Berenguer, Monovar, Alicante, Spain.

SPIRITS.

*Report.*—Double distilled aguardiente, a very good and very cheap distilled spirit.

## 1369. Zouharie, Monastir, Turkey.

SPIRIT OF MENTH.

*Report.*—Pure menthal spirit, of good quality, and very well conditioned.

## 1370. J. M. da Silva Rebello, Pará, Brazil.

SPIRITS.

*Report.*—Aguardiente de caju, spirit distilled from the caju fruit with much care, so as to present a real fine well-flavored brandy, having the characteristic of the fruit.

## 1371. M. Aloes &amp; Co., Rio de Janeiro, Brazil.

SPIRITS.

*Report.*—"Laranginha" spirits, of sugar-cane, of very good quality and fine distillation.

1372. **Estevão Jose Pereira, Rio de Janeiro, Brazil.**

## SPIRITS.

*Report.*—Aguardiente of good quality and cheap; also refined into *laranginha* of very good grade. Very commendable results of careful distillation from sugar-cane.

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1373. **João do Amaral Rapozo, Pernambuco, Brazil.**

## DISTILLED SPIRITS.

*Report.*—A collection of distilled spirits, of which the *Genebra* was fine, the *Aguardiente de Caju* very good, and the *Aguardiente de Abacaxi* excellent, both in distillation and flavor.

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1374. **Francisco Luiz Carreira, Ceará, Brazil.**

## SPIRITS.

*Report.*—Aguardiente from sugar-cane, canna laranja, and caju; superior in quality, showing very careful distillation.

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1375. **Braga Brothers & Co., Rio de Janeiro, Brazil.**

## SPIRITS.

*Report.*—A line of finely-distilled liquors, gin, rum, *laranginha*, including alcohol; showing all very careful combination and manipulation.

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1376. **J. J. A. Braz, São Paulo, Brazil.**

## SPIRITS.

*Report.*—Spirits distilled from various fruits and cereals, of a very good character, especially that from plums (*aguardiente de ameixa*), and from maize (*aguardiente de milho*).

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1377. **H. Ageert, Corrientes, Argentine Republic.**

## SPIRITS.

*Report.*—Very good liquor of limes and orange spirits; both retaining their natural fine flavors, in fair strength, while carefully distilled into good liquors.

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1378. **Luis Villa, Corrientes, Argentine Republic.**

## SPIRITS OF CAÑA (SUGAR-CANE).

*Report.*—Commended for the extra good quality of his spirits of *caña*, showing very careful distillation.

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1379. **Wilhelm Stengel, Leipsic, Germany.**

## POTATO SPIRIT, RECTIFIED.

*Report.*—Commended for perfect purity, entire freedom from fusil.

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1380. **Landauer & Macholl, Heilbronn, Germany.**

## FRUIT SPIRITS.

*Report.*—The cherry and blackberry brandies were found meritorious for purity of taste and careful distillation.

**1381. Moboda Manufacturing Co., Moboda, Sweden.**

## SPIRITS.

*Report.*—Commended for the entire novelty of the material used, viz., reindeer moss, growing wild in large quantities at the places where it is thus utilized; special advantages in its treatment, and an excellent result; a good quality of spirits, of a very agreeable flavor. Several samples show different modes of fermentation.

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**1382. H. Riquieri & Co., Valparaiso, Chili**

## SPIRITS.

*Report.*—A variety of cordials, Vino, Vermouth, and Cognac, of good taste and careful preparation.

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**1383. Hannis Distilling Co., Philadelphia, Pa., U. S.**

## RYE WHISKY.

*Report.*—Very fine, and show much improvement by age.

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**1384. Sattler & Co., Baltimore, Md., U. S.**

## RYE WHISKY.

*Report.*—Very good spirit, good flavor.

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**1385. Cork Distilleries Co., Cork, Ireland.**

## IRISH WHISKY.

*Report.*—Very fine, full flavor, and good spirit.

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**1386. John Jamison & Sons, Dublin, Ireland.**

## WHISKY.

*Report.*—Very good.

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**1387. I. Landsberger & Co., San Francisco, Cal., U. S.**

## CALIFORNIA GRAPE BRANDY.

*Report.*—Very good flavor.

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**1388. H. M. Naglee, San José, Cal., U. S.**

## CALIFORNIA BRANDY.

*Report.*—Five samples of brandy, from one to five years old, distilled from the Burgundy and Riesling grape; the only American brandy on exhibition that approaches the fine French spirits in flavor; very fine in every particular.

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**1389. S. Rosenberg, Cape Town, Cape of Good Hope.**

## BRANDY.

*Report.*—Very good, aromatic, and made of grape wine.

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**1390. H. H. Marais, Robertson, Cape of Good Hope.**

## BRANDY.

*Report.*—Very aromatic, and made from grape wine.

**1391. James Knight, Halifax, Nova Scotia.**

BRANDY OF CHERRY.

*Report.*—Very good brandy, well prepared; agreeable bouquet and well conditioned.**1392. Wine Growers' Association, Toronto, Ontario, Canada.**

WINE AND BRANDY.

*Report.*—Very good wine, of fine bouquet, excellent quality, and very well prepared. The brandy is very fine, and has a particularly good taste.**1393. Otard, Dupuy, & Co., Cognac, France.**

BRANDY.

*Report.*—A collection of young and old brandies, in casks and cases, very superior as regards quality and age.**1394. Boutelleau & Co., Barbezieux, near Cognac, France**

BRANDY.

*Report.*—A good selection of brandies, in wood and in bottle, showing quality and age, and obtainable at reasonable figures.**1395. Pinet, Castillon, & Co., Cognac, France.**

BRANDY.

*Report.*—Samples of young and old brandies of good quality.**1396. Rouyer, Guillet, & Co., Saintes, near Cognac, France.**

BRANDY.

*Report.*—Samples of brandies of various vintages, clean wine spirit, obtainable at cheap rates.**1397. Anonymous Society of the Distilleries of Jonzac, near Cognac, France.**

BRANDY.

*Report.*—Good specimens of brandies grown on the vineyards of various wine-growers and distilled with care.**1398. Emile Dubois & Co., Saint-Jean-d'Angély, near Cognac, France.**

BRANDY.

*Report.*—A good selection of young and old brandies, very clean wine spirit, which can be imported at moderate prices.**1399. Rivière, Gardrat, & Co., Cognac, France.**

BRANDY.

*Report.*—A collection of brandies of various vintages, showing quality and age.**1400. Duquénel, Paris, France.**

BRANDY.

*Report.*—Good specimens of brandy, grown on the exhibitor's vineyard, clean spirit, well distilled.

## 1401. Jules Bellot &amp; Co., Cognac, France.

BRANDY.

*Report.*—Old and young brandies of a good quality, obtainable at very reasonable rates.

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## 1402. A. C. Menkow &amp; Co., Cognac, France.

BRANDY.

*Report.*—Samples of brandies of various vintages, clean wine spirit, obtainable at cheap rates.

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## 1403. L. Fouchez &amp; Co., Cognac, France.

BRANDY.

*Report.*—Samples of brandies of various vintages; clean wine spirit.

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## 1404. J. Faure &amp; Co., Cognac, France.

BRANDY.

*Report.*—Samples of old and young brandies of good quality.

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## 1405. F. Dessandier &amp; Co., Jarnac, near Cognac, France.

BRANDY.

*Report.*—Good samples of old and young brandies, very clean wine spirit, which can be imported at moderate rates.

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## 1406. Jules Duret &amp; Co., Cognac, France.

BRANDY.

*Report.*—Samples of brandies of various vintages, showing quality and age, and obtainable at moderate figures.

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## 1407. Durozier &amp; Co., Cognac, France.

BRANDY.

*Report.*—Cremant, sparkling brandy; a new style, nicely prepared.

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## 1408. Gourry &amp; Co., Cognac, France.

BRANDY.

*Report.*—A selection of brandies of various vintages and qualities, obtainable at cheap rates.

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## 1409. Union Agricole de Châteauneuf, Châteauneuf, near Cognac, France.

BRANDY.

*Report.*—Good specimens of brandies grown at the vineyards of various wine-growers and distilled with care.

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## 1410. A. Brøndum, Copenhagen, Denmark.

CORN BRANDY.

*Report.*—Well compounded; very fine flavor.

**1411. Luis Guimel Garcia, Aspe, Alicante, Spain.**

AGUARDIENTE (SPANISH BRANDY).

*Report.*—Very pure and exceedingly well distilled liquor.**1412. Bodega de Lecanda, Valladolid, Spain.**

BRANDY.

*Report.*—It is a pure, well-flavored brandy, from grape, of very good distillation.**1413. Inchausti & Co., Manila, Philippine Islands.**

PALM BRANDY.

*Report.*—Different varieties of palm brandy, made from the sap of the tree. Very good quality.**1414. Antonio Jacome da Costa, Gavião, Portalegre, Portugal.**

BRANDY.

*Report.*—Very fine distilled spirit from wine, alcohol proof. Used for reinforcing wines.**1415. Serafim Garcia Ribeiro, Coimbra, Portugal.**

BRANDY, 1870.

*Report.*—Very fine distilled spirit from wine, alcohol proof.**1416. Antonio Dias Themido, Coimbra, Portugal.**

COGNAC.

*Report.*—Very fine; made from grape; well distilled and very pure.**1417. Joaquim Antonio Simoes, Coimbra, Portugal.**

BRANDY.

*Report.*—Very fine distilled spirits from wine, alcohol proof.**1418. Portuguese Government, Portugal.**

BRANDIES, WINES, AND VINEGARS.

*Report.*—A great collection of brandies, wines, and vinegars, made of sugar-cane and of different other tropical plants, showing the resources and productiveness of the Portuguese colonies in Africa and in the Indies.**1419. Luiza da Silva Alhayde Costa, Leiria, Portugal.**

BRANDY.

*Report.*—Very fine distilled spirit from wine, alcohol proof.**1420. Jose Maria da Silva, Elvas, Portalegre, Portugal.**

BRANDY AND SPIRIT OF WINE.

*Report.*—Very fine, distilled from wine and used for reinforcing new wines, alcohol proof.

**1421. Jose Ignacio de Macedo Baptista, Mirandella, Bragança, Portugal.**

BRANDY.

*Report.*—Very fine distilled spirit from wine, alcohol proof.**1422. Camillo de Macedo, Jr., Villa Real, Portugal.**

BRANDY.

*Report.*—Very fine distilled spirit from wine, alcohol proof; used for reinforcing wines.**1423. Jose Antonio Gonsalves Serodio, Villa Real, Portugal.**

BRANDY.

*Report.*—Very fine distilled spirit from wine, alcohol proof; used for reinforcing new wines.**1424. Joaquim Fortunato Levita, Portalegre, Portugal.**

BRANDY.

*Report.*—Very fine distilled spirit from wine, alcohol proof; used for reinforcing wines.**1425. Joaquim de Salles Simoes Carreira, Batalha, Leiria, Portugal.**

BRANDY.

*Report.*—Very fine distilled spirit from wines, alcohol proof.**1426. João Alves Morgado, Constança, Santarem, Portugal.**

BRANDY, 1873.

*Report.*—Very fine distilled spirit from wine; used for reinforcing wines; alcohol proof.**1427. Maria Jose Lopes Pedroza, Coimbra, Portugal.**

BRANDY.

*Report.*—Very fine distilled spirit from wine, alcohol proof; used for strengthening wine.**1428. Francisco Thiago Magalhaes, Sinde, Coimbra, Portugal.**

BRANDY.

*Report.*—Very good, well-distilled spirit from wine, alcohol proof; used for strengthening new wines.**1429. Antonio Manuel Ferreira Barros, Mondim da Beira, Vizeu, Portugal.**

BRANDY.

*Report.*—Very fine distilled spirit from wines, alcohol proof; used for strengthening wines.**1430. Nicholas Rafftopulos, Samos, Turkey.**

BRANDY.

*Report.*—A well-distilled brandy, very pure, and carefully prepared.**1431. Yanni Papa, Island of Crete, Turkey.**

GRAPE BRANDY.

*Report.*—A well-distilled, pure grape brandy.

**1432. Mehannegi, Island of Crete, Turkey.**

BRANDY.

*Report.*—Dry brandy of pleasant rose flavor, fine quality, and well conditioned.**1433. G. & L. Stein, Offenburg, Germany.**

CHERRY BRANDY.

*Report.*—Commended for excellent and pure flavor, and moderate prices.**1434. Alois Mumelter, Zwölfmalgreien, near Bozen, Austria.**

CHERRY BRANDY.

*Report.*—Commended for the fine quality of his old cherry brandy.**1435. Scherer Brothers, Meggen, Switzerland.**

CHERRY BRANDY.

*Report.*—Commended for fine quality.**1436. Isidro Molina, Rute, Cordoba, Spain.**

AGUARDIENTE.

*Report.*—His aguardiente is very pure and strong, with a good flavor.**1437. Julio del Pino y Gomez, Malaga, Spain.**

AGUARDIENTE.

*Report.*—A superfine spirit, distilled from wine of first-rate quality.**1438. Juan José Barruiso Lopez, La Victoria, Canary Islands.**

AGUARDIENTE DE VINOS VIEJOS.

*Report.*—Well-distilled spirits, retaining to a high degree the fine aroma of the old wines from which they are made.**1439. Victoria Lahoz, Escatron, Zaragoza, Spain.**

AGUARDIENTE ANISADO.

*Report.*—A very fine and pure spirit.**1440. Antonio de Carvalho Oliveira, Maranhão, Brazil.**

AGUARDIENTE DE CAÑA.

*Report.*—Spirits from sugar-cane, good and fine; the products of very superior distillation.**1441. Francisco de Barros, Lima, São Paulo, Brazil.**

AGUARDIENTE DE MEL DE ABELHA.

*Report.*—Spirits distilled from honey in a very careful manner, retaining a slight but very agreeable wax aroma. A very successful effort to utilize honey of otherwise unmerchable quality.



## 1442. Daniel Lawrence &amp; Sons, Boston, Mass., U. S.

MEDFORD RUM.

*Report.*—Of very fine flavor, and show much improvement by age.

## 1443. J. E. Davidson, Mackay, Queensland, Australia.

RUM.

*Report.*—The best and the least fiery of the several exhibits of rum of the same colony, showing more careful distillation; a very good flavor.

## 1444. Prats Brothers &amp; Co., Ponce, Porto Rico.

RUM.

*Report.*—Their old Porto Rico rum is very good, strong, and pure.

## 1445. Bueno &amp; Co., Santiago de Cuba, Cuba.

RUM.

*Report.*—Of very good quality, very good aroma, well made, and strong.

## 1446. Thomas P. Geremoabo, Pernambuco, Brazil.

RUM.

*Report.*—Very fine distillations from the sugar-cane, rendering a delicate aroma in the several samples.

## 1447. Georgia Estate, Jamaica.

RUM (G &lt;math&gt;\leftrightarrow&lt;/math&gt; P).

*Report.*—Fine spirit, well distilled, and of remarkably fine aroma.

## 1448. Hordley Estate, Jamaica.

RUM (<sup>H.</sup><sub>M. L.</sub> CROP 1865).*Report.*—Fine spirit, well distilled, and of remarkably fine aroma.

## 1449. New Work Estate, Jamaica.

RUM.

*Report.*—Fine spirit, well distilled, and of remarkably fine aroma.

## 1450. Lansquinet Estate, Jamaica.

RUM.

*Report.*—Fine spirit, well distilled, and of remarkably fine aroma.

## 1451. Bluecastle Estate, Jamaica.

RUM (I. W. O.).

*Report.*—Fine spirit, well distilled, and of remarkably fine aroma.

## 1452. Amity Hall Estate, Jamaica.

RUM (<sup>A.</sup><sub>T. C.</sub> CROP 1876).*Report.*—Fine spirit, well distilled, and of remarkably fine aroma.

## 1453. P. Hoppe, Amsterdam, Netherlands.

GIN AND CURAÇOA.

*Report.*—Very aromatic gin, of a great variety of taste.  
Very sweet anisette.

---

## 1454. J. J. Meder &amp; Son, Schiedam, Netherlands.

GIN.

*Report.*—Superior gin, of a very soft and very clean savor.

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## 1455. J. A. J. Nolet, Schiedam, Netherlands.

GIN AND ALCOHOL.

*Report.*—Gin of a pronounced flavor, and of a good quality in general.  
Alcohol of good quality.

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## 1456. A. Houtman &amp; Co., Schiedam, Netherlands.

GIN.

*Report.*—Of a very good aroma, and in general of good quality

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## 1457. Schade &amp; Buijsing, Schiedam, Netherlands.

GIN.

*Report.*—Of fine flavor and good composition.

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## 1458. P. Rademakers &amp; Co., Delftshaven, Netherlands.

GIN.

*Report.*—Very spirituous gin, of a very pronounced aroma and taste.

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## 1459. Blankenheim &amp; Nolet, Rotterdam, Netherlands.

GIN.

*Report.*—Very fine gin, of the best quality, and of good flavor.

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## 1460. Van Dulken, Weiland, &amp; Co., Rotterdam, Netherlands.

GIN, BRANDY, AND ALCOHOL.

*Report.*—Very fine gin; good alcohol and brandy.

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## 1461. J. Kiderlen, Delftshaven, Netherlands.

GIN AND ALCOHOL.

*Report.*—Alcohol of a very pure taste.  
Gin of a remarkable flavor, and of a very delicate taste.

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## 1462. Van Zuijlekom, Levert, &amp; Co., Amsterdam, Netherlands.

GIN.

*Report.*—Gin of a remarkable aroma; very good.

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## 1463. Van den Burgh &amp; Co., Antwerp, Belgium.

GIN AND RED BITTER CORDIAL.

*Report.*—The finest and the purest gin. Very good red bitter cordial.

## 1464. F. C. Davis, Adelaide, South Australia, Australia.

## LIQUORS.

*Report.*—An assortment of very good cordials, bitters, and brandies, showing good taste and careful distilling.

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## 1465. A. Dechariot, Moscow, Russia.

## LIQUORS.

*Report.*—A large assortment of liquors, distilled with clean spirit; of good flavor, and cheap.

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## 1466. Victor Briantzeff, Irkootsk, Russia.

## LIQUORS.

*Report.*—A large assortment of liquors, brandies; clean spirit; commended for good flavor, careful preparation, and cheapness.

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## 1467. Pauline Rouget, Moscow, Russia.

## LIQUORS.

*Report.*—Liquors of all kinds, very carefully prepared; clean spirit, good flavor, and attainable at moderate prices.

---

## 1468. Varaksin &amp; Sanin, Kazan, Russia.

## LIQUORS.

*Report.*—Liquors, rum, kummel, Curaçao bitters; distilled with good spirit, and remarkable as regards quality and cheapness.

---

## 1469. Baron Korf (firm Beckman &amp; Co.), St. Petersburg, Russia.

## LIQUORS.

*Report.*—A large assortment of liquors of all kinds, remarkable for distillation and quality.

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## 1470. Marquis Traversé, Looga, St. Petersburg, Russia.

## LIQUORS.

*Report.*—A large assortment of liquors; very good imitation of Dutch and French liquors; prepared with care and sold at low prices.

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## 1471. Karali &amp; Co., St. Petersburg, Russia.

## LIQUORS.

*Report.*—A large assortment of liquors, maraschino, Riga balsam white, Holland gin, etc., distilled with care.

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## 1472. Basil Petrof, St. Petérsburg, Russia.

## LIQUORS.

*Report.*—A selection of liquors and brandies, distilled with the grain spirit of the country; well prepared and cheap.

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## 1473. Peter Smirnof, Moscow, Russia.

## LIQUORS.

*Report.*—Liquors, kummel, brandy distilled with the grain (?) spirit; clean, palatable, prepared with great care.

**1474. Alexander von Grote, Lemburg, near Riga, Russia.**

## LIQUORS.

*Report.*—Liquors, kummel, crème de Lembourg; excellent spirit, of remarkable flavor.

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**1475. Victor Lilieroth, Helsingfors, Russia.**

## LIQUORS.

*Report.*—Imperial punch, very well cordialized; of excellent flavor.

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**1476. Fockroth & Co., St. Petersburg, Russia.**

## LIQUORS.

*Report.*—Liquors, kummel, Russian brandy; clean spirit; nice flavor; moderate prices.

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**1477. F. Yankovsky, Warsaw, Russia.**

## LIQUORS.

*Report.*—Different sorts of brandies consumed in the country, distilled with great care, palatable and cheap.

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**1478. Alexander Grevesmuehl, Moscow, Russia.**

## LIQUORS.

*Report.*—Very fine specimens of Russian brandies; clean spirit; delicate flavor.

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**1479. Natus & Co., St. Petersburg, Russia.**

## LIQUORS.

*Report.*—Liquors, kummel, brandy, etc.; well prepared; good quality and cheap.

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**1480. Keller & Co., St. Petersburg, Russia.**

## LIQUORS.

*Report.*—Liquors, kummel, eckan; elegantly prepared; first-rate distillation.

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**1481. Peter Kalashnikof, Pskof, Russia.**

## LIQUORS.

*Report.*—All kinds of liquors; well distilled; nicely prepared, and sold at very low prices.

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**1482. Sawada Zembeye, Tomo, Bingo, Japan.**

## LIQUORS AND WINES.

*Report.*—A fine collection of wines and liquors (awamori), carefully prepared.

---

**1483. Delizy & Doiston Son, Pantin, near Paris, France.**

## LIQUORS.

*Report.*—Good specimens of French liquors, of nice flavor, and remarkable for their cheapness.

**1484. Marie Brizard & Roger, Bordeaux, France.**

## LIQUORS.

*Report.*—Samples of French liquors, very superior aniseed, which cannot be surpassed in France.

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**1485. Mme. Dolin, Chambéry, France.**

## LIQUORS.

*Report.*—Very good Vermouth, distilled and prepared with care.

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**1486. E. Ditely, Paris, France.**

## LIQUORS.

*Report.*—Vin Tannigne de Bagnols St. Jean, tonic wine or liquor; very good for delicate persons at meals.

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**1487. Rousseau Brothers, Paris, France.**

## LIQUORS.

*Report.*—Samples of liquors, as Curaçao, aniseed, etc., nicely flavored; remarkable for their cheapness.

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**1488. J. Combier, Saumur, France.**

## LIQUORS.

*Report.*—An assortment of good French liquors, commended for the "Elixir Combier," very nicely prepared and highly flavored.

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**1489. L. Bouyer & Co., Cognac, France.**

## LIQUORS.

*Report.*—Sparkling brandy; a new style, nicely prepared.

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**1490. B. Tivet, Bordeaux, France.**

## LIQUORS.

*Report.*—Bitters expressly prepared for export; good and cheap.

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**1491. P. Garnier, Noyon, France.**

## LIQUORS.

*Report.*—A collection of very fine liquors, distilled with the greatest care; remarkable cheapness.

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**1492. Chaboseau & Payen, Levallois-Peret, near Paris.**

## LIQUORS.

*Report.*—Very good and delicate liquor, called "Liqueur d'Or."

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**1493. E. Cusenier Son, Sr., & Co., Ornans, France.**

## LIQUORS.

*Report.*—A very large assortment of French liquors; superior in quality.

**1494. Marchand Brothers, Paris, France.**

LIQUORS; PLUMS AND CHERRIES PRESERVED IN BRANDY.

*Report.*—A large assortment of French liquors, prepared with great care, and distilled from clean spirits. The fruits are preserved carefully in good brandy, have good taste, and are firm and fresh.

**1495. Fiton Sr. & Nouvialle, Bordeaux, France.**

LIQUORS, PATÉ DE FOIE DE CANARD DE NÉRAC AUX TRUFFES; FRUITS PRESERVED IN SYRUP AND IN BRANDY; PRESERVED VEGETABLES.

*Report.*—Samples of two new liquors called Ananeine and Eureka, of nice bouquet, and distilled with pure spirit; the pâté de foie de canard de Nérac aux truffes is of good taste and excellent preservation; the fruits, both in syrup and in brandy, are very carefully preserved in form, flavor, and freshness; the preserved vegetables are commended for variety, excellent preservation and flavor, freshness, solidity, and good form.

**1496. Dètrie-Grandjean, Saint-Loupe, France.**

KIRSCH.

*Report.*—Splendid kirsch; very well distilled; high bouquet.

**1497. Wauters de Busscher, Malines, Belgium.**

LIQUORS.

*Report.*—Assorted cordials, of fine distillation and remarkable cheapness.

**1498. F. X. de Beukelaer, Antwerp, Belgium.**

LIQUOR.

*Report.*—A cordial called "Elixir d'Anvers;" good digestive liquor.

**1499. Carl Eriksen, Lyngby, Denmark.**

MEAD.

*Report.*—Commended for its delicious flavor.

**1500. Jacob Farch & Sons, Nibe, Denmark.**

TABLE LIQUOR.

*Report.*—Very good taste and fine flavor.

**1501. F. Anthony, Copenhagen, Denmark.**

LIQUORS.

*Report.*—Very good taste and fine flavor.

**1502. Aalborg Syrup and Spirit Factory, Aalborg, Denmark.**

TABLE LIQUOR.

*Report.*—Excellent in taste and fine in quality.

**1503. Antonio Lira, Caracas, Venezuela.**

SHADDOCK LIQUOR.

*Report.*—Of excellent quality; well made; a fine tonic.

## 1504. Antonio Lira, Caracas, Venezuela.

## ANISETTE.

*Report.*—Well made; good flavor; fine quality.

---

## 1505. Manuel Dieguez, Zamora, Spain.

## (LIQUOR) ACEITE DE ANIS.

*Report.*—Of the large number of samples of anise-flavored liquors, the national spirits of Spain, submitted, this was the finest and very best in every respect.

---

## 1506. Olallo Lazaro, Talavera de la Reina, Valencia, Spain.

## (LIQUOR) ACEITE DE ANIS.

*Report.*—A specialty of Spanish cordials, fine in taste, strong in aroma, and rich in composition. Very successful distillation.

---

## 1507. Juan Bautista Sifredi, Almendralejo, Badajoz, Spain.

## ANISADO PURO.

*Report.*—His anisado puro is very good, strong, and pure.

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## 1508. Francisco Plá, Reus, Tarragona, Spain.

## LIQUORS.

*Report.*—His anisette is good, strong, and well flavored.

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## 1509. Angel Maria Bustamante, Astorga, Leon, Spain.

## LIQUOR.

*Report.*—The aceite de anis is excellent, of delicious flavor and freshness.

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## 1510. Ramon Roca y Murtra, Tarragona, Spain.

## ANISADO (LIQUOR).

*Report.*—His anisado recommends itself by its good taste, strength, and clearness.

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## 1511. Antoliano Perez Albert, Monovar, Alicante, Spain.

## LIQUORS.

*Report.*—His aguardiente is excellent.

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## 1512. Salvador Font, Mataro, Barcelona, Spain.

## LIQUORS.

*Report.*—He has a very fine collection of liquors of every description, remarkable for their careful preparation and delicious flavor.

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## 1513. José Iniguez, Gibrleon, Spain.

## LIQUORS.

*Report.*—His aguardiente anisado is remarkably good, strong, and well flavored.

## 1514. Antonio Soldan, La Palma, Spain.

## LIQUOR.

*Report.*—His aguardiente anisado recommends itself for its strength, purity, and cheapness.

---

## 1515. Juan Camprubi, Barcelona, Spain.

## LIQUOR.

*Report.*—This liquor is remarkably well flavored, strong, and clear.

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## 1516. Joaquim Pedrosa de Castell de Mas, Barcelona, Spain.

## LIQUOR (MONTSERRAT).

*Report.*—A liquor of special merit, in fineness, taste, and aroma, both the “amarillo” and the “verde;” the latter most delicate.

---

## 1517. Davernat &amp; Co., Velez Rubio, Almeria, Spain.

## LIQUORS.

*Report.*—Their aguardiente de higos (fig-brandy) is very good, and deserves to be encouraged.

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## 1518. Miguel Jaume, Santa Maria, Balearic Islands.

## LIQUORS.

*Report.*—His “doble anisado” is excellent, both in flavor and purity.

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## 1519. Lamolla Brothers, Lerida, Spain.

## LIQUORS.

*Report.*—Their “anisado superior” is very good, clear, well flavored, and strong.

---

## 1520. Manuel de la Cueva, La Palma, Huelva, Spain.

## LIQUORS.

*Report.*—His anisette is excellent, of good flavor, strength, and clearness.

---

## 1521. Joaquim Bueno &amp; Co., Malaga, Spain.

## LIQUORS.

*Report.*—A splendid collection of liquors,—aguardiente dulce, maraschino, crème de coraço; excellent flavor, beautiful color.

---

## 1522. Widow of Pasquale &amp; Sons, Madrid, Spain.

## LIQUORS (ANIS).

*Report.*—A very good “Anis escharchado,” and an equally good “Anis de Burdeas” liquor or cordial; finely distilled, strongly flavored, and rich in sugar.

---

## 1523. Agustin Lopez de San Roman, Madrid, Spain.

## LIQUORS.

*Report.*—His aguardiente anisado is excellent, and remarkably suited to the Spanish taste.



## 1524. Manuel Ripolles y Perez, Castellon, Spain.

## LIQUORS.

*Report.*—His anisado Hollanda, of third grade, is very good, strong, and well flavored.

---

## 1525. Nicolas Gomez Gonzales, Huelva, Spain.

## LIQUORS.

*Report.*—His aguardiente anisado is very good, well flavored, and strong.

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## 1526. Crispulo Paredes Diez, Valladolid, Spain.

## LIQUORS.

*Report.*—The marasquino and perla de anis are excellent, strong, clear, and well flavored.

---

## 1527. Vicente Gutierrez, Reinosa, Santander, Spain.

## LIQUORS.

*Report.*—His ginebra superior is excellent; commended for flavor, strength, and transparency; peculiarly adapted to the Spanish taste.

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## 1528. Francisco de P. Monro &amp; Co., Albaida, Valencia, Spain.

## ANISEED LIQUOR (DOLCE).

*Report.*—Excellent, strong, and delicately flavored.

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## 1529. José G. de Celis, Cortines, Santander, Spain.

## CURAÇAO.

*Report.*—Excellent, well flavored, fresh and strong.

---

## 1530. Felice Pezzoni, Lisbon, Portugal.

## VERMOUTH AND PUNCH ESSENCE.

*Report.*—Very fine taste and good flavor. The Vermouth equals the best Italian.

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## 1531. Felice Pezzoni, Lisbon, Portugal.

## LIQUORS.

*Report.*—Five varieties of liquors, viz: Liqueur Costume, Amere Inglese, Alchermes de Firenze, Fernet, and Bitter. The liquors of this collection are very fine, and prepared with the greatest care.

---

## 1532. M. P. Pollen &amp; Son, Rotterdam, Netherlands.

## CURAÇAO AND ANISETTE.

*Report.*—Curacão, rich in flavor; anisette, of a great harmony in its composition.

---

## 1533. Turkish Government, Island of Samos.

## LIQUOR OF SAGES.

*Report.*—Of excellent quality; finely distilled; very effective

## 1534. Yussep, Sivas, Turkey.

## TURKISH LIQUOR.

*Report.*—Turkish liquor called "Mastic;" well prepared and of very good flavor.

---

## 1535. V. Zanni, Constantinople, Turkey.

## HAREM'S LIQUOR.

*Report.*—Very fragrant and tonic liquor; beautiful color; well conditioned.

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## 1536. M. Y. M. Carvalho, Santa Catharina, Brazil.

## CURAÇAO.

*Report.*—Of fine good quality, well prepared, delicious taste, and in excellent condition.

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## 1537. Peter Calatrani, Buenos Ayres, Argentine Republic.

## LIQUORS.

*Report.*—A variety of most delicious cordials, distilled with the greatest care and of the best materials. Especially notable among them, the Amor de Patria, from cacao, and the Balsamo de Banana.

---

## 1538. M. S. Bagley, Buenos Ayres, Argentine Republic.

## LIQUOR.

*Report.*—Commended for the excellent quality and good composition of his "Hesperidina," a liquor produced by the distillation of bitter oranges.

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## 1539. Beniamino d'Alessandro, Benevento, Italy.

## PUNCH.

*Report.*—Punch made from sea-weed, and containing very tonic and strengthening substances; agreeable to the taste.

---

## 1540. Isolabella &amp; Co., Milan, Italy.

## CORDIALS.

*Report.*—A very large assortment of excellent liquors, prepared in a special way, and of incontestable superiority; the "Elixir Cagliostro," especially, being delicious.

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## 1541. Giacomo Protto, Novi, Ligure, Italy.

## PREPARED PUNCH.

*Report.*—Excellent to mix with water. It retains all its aromatic flavor, and is a superior article.

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## 1542. Bianca Brothers &amp; Co., Milan, Italy.

## CORDIALS—VERMOUTH AND ALCOHOL.

*Report.*—The exhibit consists of different cordials, such as soda, champagne, anisette, alkermes, tea extract, granatina, coffee extract, and chartreuse, made with the greatest care, of delicious flavors, fine quality, and in excellent condition. Also, excellent vermouth, in perfect condition, and alcohol of very good quality, 188 A. M. degrees, made from maize, and very cheap.

## 1543. Louis Ackermann, Jr., Berlin, Germany.

## LIQUEURS.

*Report.*—Commended for strikingly superior quality.

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## 1544. Baecker &amp; Fier, Treves, Germany.

## LIQUEURS AND COGNAC.

*Report.*—Commended for the good quality of the cognac made from Moselle grapes; for their endeavors to utilize in a practical way the Moselle grape in inferior vintage years.

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## 1545. G. Brumby, Luckau, Germany.

## LIQUEURS.

*Report.*—Commended for the very pleasant style and good quality of his "Magenwasser."

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## 1546. Franz Naumann, Delitzsch, Germany.

## LIQUEURS.

*Report.*—Commended for very superior quality of his "kümmel."

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## 1547. Fritz &amp; Conrad Lehment, Rostock and Kiel, Germany.

## LIQUEURS AND SPIRITS.

*Report.*—Commended for the excellent and well-maintained flavor of fruit liqueurs.

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## 1548. J. A. Gilka, Berlin, Germany.

## LIQUEURS.

*Report.*—Commended for excellent quality.

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## 1549. Theo. Kopp &amp; Son, Wesel, Germany.

## LIQUEURS AND VINEGAR.

*Report.*—Commended for the good quality of some of their liqueurs. For the excellent composition of their vinegar.

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## 1550. Marie &amp; Justine Hoffmann, Pfalzburg, Germany.

## LIQUEURS.

*Report.*—Commended for the remarkably fine flavor and excellent taste of their "eau de noyau."

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## 1551. Hermann Stibbe, Cologne, Germany.

## LIQUEURS.

*Report.*—Commended for superior flavor and careful distillation.

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## 1552. Schneider &amp; Schorn, Magdeburg, Germany.

## ESSENCES.

*Report.*—Commended for very clever composition and distillation.

## 1553. Giovanni Scarizza, Spalato, Dalmatia, Austria.

## LIQUORS.

*Report.*—The sample submitted was found the best "Marasquino" exhibited; very superior in composition and style.

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## 1554. F. Lord &amp; Co., Vienna, Austria.

## AUSTRIAN LIQUORS.

*Report.*—Commended for happy combination and careful preparation.

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## 1555. Ignaz Strakosch, Gross-Seelovitz, near Brünn (Moravia), Austria.

## LIQUORS.

*Report.*—Commended for good composition and careful preparation.

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## 1556. Anton Cosmacendi, Zara, Dalmatia, Austria.

## LIQUORS.

*Report.*—Commended for fine quality and excellent aroma, especially his "Rosolio."

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## 1557. Girolamo Luxardo, Zara, Dalmatia, Austria.

## LIQUORS.

*Report.*—Commended for the excellent aroma and quality of his "Marasquino."

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## 1558. Matthäus Magazzin, Zara, Dalmatia, Austria.

## LIQUORS.

*Report.*—Commended for the good preparation and happy composition of his "Marasquino."

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## 1559. Julius Schnabel, Oravitza, South Hungary, Austria.

## LIQUORS.

*Report.*—Commended for the good quality and careful distillation of his 60 r. "Sliwowitzza."

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## 1560. Marko &amp; Weyden, Budapest, Austria.

## LIQUORS AND PRESERVED FRUITS.

*Report.*—Commended:

1. For the excellent quality and high flavor of the Slivovitz.
  2. Exhibit of Bosnia and Servia dried prunes and prune marmalade; fruit good and well preserved.
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## 1561. Levert &amp; Co., Amsterdam, Netherlands.

## CURAÇAO.

*Report.*—Curaçao of a very rich savor and aroma.

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## 1562. H. Bootz &amp; Co., Amsterdam, Netherlands.

## CURAÇAO AND ANISETTE.

*Report.*—Green curaçao, of a delicate taste; the savors of the constituents well blended. Green anisette, of good taste and flavor.

1563. **Catz & Son, Pekel-A, Groningen, Netherlands.**

BITTERS AND LIQUORS.

*Report.*—Of very fine taste; bitters renowned as a very wholesome preparation.1564. **De Bont & Leijten, Amsterdam, Netherlands.**

LIQUORS.

*Report.*—Very fine and delicious liquors, distilled with the greatest care.1565. **Wijnand Fockink, Amsterdam, Netherlands.**

CURAÇAO, ANISETTE, AND MARASCHINO.

*Report.*—Curaçao of a superior fineness.

Anisette of a great softness; the best anisette presented by the Netherlands.

Maraschino of remarkable delicacy and clean taste.

1566. **The Heirs of Lucas Bols, Amsterdam, Netherlands.**

CURAÇAO AND ANISETTE.

*Report.*—Curaçao of great delicacy; perfect anisette; superior products.1567. **Oscar Salicath, Christiania, Norway.**

PUNCH AND OTHER LIQUORS.

*Report.*—An assortment of very pleasant cordials, composed with good taste, and well distilled.1568. **Frants Tandberg, Drammen, Norway.**

AQUAVIT LIQUOR.

*Report.*—The national Norwegian "dram," in great perfection.1569. **H. Poulsen & Co., Christiania, Norway.**

PUNCH.

*Report.*—A well-composed cordial, of good flavor.1570. **Jorgen B. Lysholm, Trondhjem, Norway.**

LIQUORS.

*Report.*—Aquavits of various ages and excellent distillation; also, arrack punch of superior quality.1571. **Hogstedt & Co., Stockholm, Sweden.**

PUNCH (LIQUOR).

*Report.*—Commended for the excellent quality, careful preparation and distillation of the several kinds of punch.1572. **C. G. Pratin & Co., Göteborg, Sweden.**

PUNCH (LIQUOR).

*Report.*—The various grades exhibited are adapted by cheapness and by quality (good to excellent) to the demands of an extensive trade.

## 1573. C. G. Berg, Karlshamn, Sweden.

## LIQUORS.

*Report.*—Several kinds of punch, Bränvin (rectified whisky), and Pommeranz bitters, all of very good quality, the result of careful distillation and tasteful composition.

## 1574. J. Cederlund's Sons, Stockholm, Sweden.

## PUNCH (LIQUORS).

*Report.*—Very good quality "genuine caloric punch," very delicate.

## 1575. L. A. Bolle Son, Verrières, Switzerland.

## ABSINTHE.

*Report.*—Commended for fine flavor and good style.

## 1576. Ed. Pernod, Couvet, Switzerland.

## ABSINTHE.

*Report.*—Commended for fine quality and careful distillation.

## 1577. Henny &amp; Moullet, Fleurier, Switzerland.

## ABSINTHE.

*Report.*—Commended for good quality and flavor.

## 1578. Von Almen &amp; Kopp, Fleurier, Switzerland.

## ABSINTHE.

*Report.*—Commended for good quality combined with moderate price.

## 1579. C. F. Berger, Couvet, Switzerland.

## ABSINTHE.

*Report.*—Commended for good quality and careful composition.

## 1580. S. Bernhard, Samaden, Switzerland.

## LIQUORS.

*Report.*—Commended for the excellent quality, aromatic flavor, and careful distillation of his *Ivaliqueurs*.

## 1581. Chr. Stauffenegger, Travers, Switzerland.

## ABSINTHE.

*Report.*—Commended for the very elegant composition of his absinthe.

## 1582. Zug Kirschwasser Co., Zug, Switzerland.

## CHERRY BRANDY.

*Report.*—Commended for genuine good quality and striking flavor.

## 1583. Bergner &amp; Engel, Philadelphia, Pa., U. S.

## LAGER BEER.

*Report.*—Perfect in brightness, nearly so in taste, and excellent in flavor.

## 1584. Valentine Blatz, Milwaukee, Wis., U. S.

## LAGER BEER.

*Report.*—Commended for perfect brightness and taste, and for excellence in flavor.

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## 1585. Frederick Lauer, Reading, Pa., U. S.

## LAGER BEER.

*Report.*—Perfect in brightness; excellent in taste and flavor.

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## 1586. Bergner &amp; Engel, Philadelphia, Pa., U. S.

## BOTTLED LAGER BEER.

*Report.*—Perfect in brightness, and very good in every other requisite.

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## 1587. E. Anheuser Co.'s Brewing Association, St. Louis, Mo., U. S.

## BOTTLED LAGER BEER.

*Report.*—Perfect in brightness; excellent in taste; very good in aroma.

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## 1588. W. J. Lemp, St. Louis, Mo., U. S.

## BOTTLED LAGER BEER.

*Report.*—Nearly perfect in brightness, excellent in taste, and very good in flavor.

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## 1589. Valentine Blatz, Milwaukee, Wis., U. S.

## BOTTLED LAGER BEER.

*Report.*—Perfect in brightness; very good in taste and flavor.

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## 1590. H. Clausen &amp; Son, New York, N. Y., U. S.

## BOTTLED LAGER BEER.

*Report.*—Perfect in brightness; very excellent in taste and flavor.

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## 1591. Geo. Ehret, New York, N. Y., U. S.

## BOTTLED LAGER BEER.

*Report.*—Perfect in brightness; excellent in taste and flavor.

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## 1592. S. Liebmann's Sons, Williamsburg, N. Y., U. S.

## BOTTLED LAGER BEER.

*Report.*—Perfect in brightness; excellent in taste and flavor.

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## 1593. Elias &amp; Betz, New York City, N. Y., U. S.

## LAGER BEER.

*Report.*—Perfect in brightness; very excellent in taste; excellent in flavor.

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## 1594. Mayer &amp; Bachmann, Staten Island, N. Y., U. S.

## LAGER BEER.

*Report.*—The two best samples of all the beer submitted: that marked XII, perfect in brightness, and nearly so in taste and flavor; that marked R, perfect in every requisite of a good lager beer, viz.: in brightness, taste, and flavor.

**1595. Joseph Uhrig Brewing Co., St. Louis, Mo., U. S.****LAGER BEER.**

*Report.*—Perfect in brightness; excellent in taste and flavor.

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**1596. Joseph Schlitz Brewing Co., Milwaukee, Wis., U. S.****LAGER BEER.**

*Report.*—Three different samples: the one marked X, very excellent in brightness, taste, and flavor; the one marked Q, perfect in brightness and taste, and excellent in flavor; the one marked O, perfect in brightness and taste; very excellent in flavor.

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**1597. Phillip Best Brewing Co., Milwaukee, Wis., U. S.****LAGER BEER.**

*Report.*—Two samples of lager beer: one marked XXV, nearly perfect in brightness and taste; one marked D, perfect in brightness, and very excellent in taste and flavor.

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**1598. Geo. Bechtel, Stapleton, Staten Island, N. Y., U. S.****LAGER BEER.**

*Report.*—Perfect in brightness; excellent in flavor and taste.

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**1599. S. Liebmann's Sons, Williamsburg, N. Y., U. S.****LAGER BEER.**

*Report.*—Excellent in brightness; very excellent in flavor and taste.

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**1600. Conrad Stein, New York, N. Y., U. S.****LAGER BEER.**

*Report.*—Perfect in brightness; very excellent in flavor and taste.

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**1601. Rubsam & Horrmann, Stapleton, Staten Island, N. Y., U. S.****LAGER BEER.**

*Report.*—Two samples: one marked XXII, excellent in brightness and flavor, nearly perfect in taste; one marked B, very excellent in brightness, taste, and flavor.

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**1602. Schmitt & Koehne, New York, N. Y., U. S.****LAGER BEER.**

*Report.*—Perfect in brightness; very excellent in taste and flavor.

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**1603. Jacob Ruppert, New York, N. Y., U. S.****LAGER BEER.**

*Report.*—Perfect in brightness, and nearly so in taste and flavor.

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**1604. John Roessle, Boston, Mass., U. S.****LAGER BEER.**

*Report.*—Perfect in brightness, and nearly so in taste and flavor.



**1605. Carl Meyerhofer, Poughkeepsie, N. Y., U. S.**

WEISS BEER.

*Report.*—Commended for the novelty and very good quality of his weiss beer.

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**1606. Valentine Loewer, New York, N. Y., U. S.**

WEISS BEER.

*Report.*—Commended for the novelty and good quality of his weiss beer.

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**1607. Francis Lutoslavsky, Lomza, Russia.**

BEER.

*Report.*—Very good taste, good condition, and good color.

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**1608. W. Krause, Warsaw, Russia.**

BEER.

*Report.*—Radzikovski beer, in fine condition, of mild character and agreeable aroma.

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**1609. John Doordin, St. Petersburg, Russia.**

BEER.

*Report.*—A light-colored beer of Bavarian style; well brewed, from Russian barley malt, with Bohemian hops.

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**1610. H. Herman, Kharkoff, Russia.**

BEER.

*Report.*—A light, very agreeable, well-brewed beer.

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**1611. Ivanholm Brewery, Copenhagen, Denmark.**

EXPORT BEER.

*Report.*—Three years old, and has made three long voyages; perfectly sound, and of very fine quality.

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**1612. Fernando Magdelin, Santa Fe, Argentine Republic.**

BEER.

*Report.*—Commended for the very good condition, taste, and flavor of his "elephanten beer," and that marked F. M.

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**1613. E. Bieckert, Buenos Ayres, Argentine Republic.**

BEER.

*Report.*—Commended for the good quality of several samples of beer submitted, having retained good condition, taste, and flavor.

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**1614. Camillo Ronzani, Bologna, Italy.**

BEER.

*Report.*—Good color; very good taste; good condition.

**1615. Metzger Brothers, Asti, Italy.****BEER AND ALE.**

*Report.*—Three kinds of beer, that called pale ale being light in body, but very good, the white beer being excellent, and the beer from corn (maize) very good indeed.

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**1616. Kaiser Brewery (Beck & Co.), Bremen, Germany.****BOTTLED LAGER BEER.**

*Report.*—Perfect in brightness; very good in every other requisite.

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**1617. Baron von Bouteville, Moering, Germany.****BEER.**

*Report.*—Commended for excellent style, taste, and condition, proving perfection in brewing.

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**1618. Pschorr's Brew-House, Munich, Germany.****BEER.**

*Report.*—Commended for excellent quality and prime condition, and perfect taste.

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**1619. Peter Overbeck, Dortmund, Germany.****BEER.**

*Report.*—Commended for good flavor, excellent condition, and perfect brewing.

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**1620. Henry T. Böttinger, Würzburg, Germany.****BEER.**

*Report.*—Commended for most perfect brewing, and excellent quality, condition, and taste.

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**1621. Tivoli Brewing Co., Berlin, Germany.****BEER.**

*Report.*—Commended for fine quality and fragrance, and good brewing and condition.

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**1622. Justus Hildebrand, Pfungstadt, Germany.****BEER.**

*Report.*—Commended for very fine quality and high flavor.

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**1623. Henry Weltz, Speier, Germany.****BEER.**

*Report.*—The exhibitor showed a beer which, although bottled three years ago, was perfect in body and sweetness, in good condition, and had developed a most striking flavor.

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**1624. Chr. Sick, Speier, Germany.****BEER.**

*Report.*—Commended for very fine quality and perfect brewing.

## 1625. Baron von Thüngen, Weissenbach, Germany.

## BEER.

*Report.*—Commended for superior quality and fine brewing.

---

## 1626. Anton Dreher, Vienna, Austria.

## BEER.

*Report.*—The beer was found perfectly brewed, fine in color, striking in aroma.

---

## 1627. First Pilsen Joint Stock Brewery, Pilsen, Bohemia, Austria.

## BEER.

*Report.*—Two samples of lager beer: the one named "Pilsner" nearly perfect in brightness and taste, and excellent in flavor; the one named "Export" perfect in brightness, and excellent in taste and flavor.

The several samples of bottled lager beer, bock beer, and export submitted were each perfect in brightness and very good in every other essential point.

---

## 1628. Moss Brewery, Moss, Norway.

## BEER.

*Report.*—Commended for clearness, good brewing, and fine aroma of good hops.

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## 1629. E. C. Dohl, Trondhjem, Norway.

## NORWEGIAN BEER.

*Report.*—A brand of pale ale, of a very agreeable taste, well brewed and mild, indicating good keeping qualities.

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## 1630. Christiania Brewery, Christiania, Norway.

## BEER.

*Report.*—Commended for strength combined with fine color and a pronounced taste.

---

## 1631. P. Ltz. Aass, Drammen, Norway.

## BEER.

*Report.*—Commended for the following reasons:

1. For a splendid very wine-like brewing,—the very champagne of beer.
  2. For good keeping quality.
- 

## 1632. Kongsberg Brewery, Kongsberg, Norway.

## BEER.

*Report.*—Commended for brilliancy in color, purity in taste, and general excellence.

---

## 1633. Chr. Wriedt, Drammen, Norway.

## BEER.

*Report.*—Commended for beauty and purity of taste.

## 1634. O. N. Forseth &amp; Co., Christiania, Norway.

## BEER.

*Report.*—Commended for purity, strength, and fine aroma, combined with great brightness.

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## 1635. Frydeulund's Brewery, Christiania, Norway

## BEER.

*Report.*—Commended for beauty in color and taste, and remarkable mildness.

---

## 1636. Hamar Brewery, Hamar, Norway.

## BEER.

*Report.*—Commended for the following reasons:

1st. Clearness, and the peculiar very fine aromatic taste.

2d. Its superior keeping qualities; a sample in good condition having been brewed in 1871.

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## 1637. Plagemann &amp; Co., Valparaiso, Chili.

## LAGER BEER.

*Report.*—Well brewed; good taste and flavor; in excellent condition.

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## 1638. Wm. Massey &amp; Co., Philadelphia, Pa., U. S.

## AMERICAN STOCK ALE.

*Report.*—Commended for good color, very bright condition, excellent taste, and fine aroma.

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## 1639. Reuter &amp; Alley, Boston, Mass., U. S.

## PRESENT-USE ALE.

*Report.*—Commended for perfection in every requisite of good ale, viz.: color, brightness, taste, and aroma.

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## 1640. C. H. Evans &amp; Co., Hudson, N. Y., U. S.

## PRESENT-USE ALE.

*Report.*—Commended for perfection in color and brightness, excellence in taste and aroma.

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## 1641. Robert Smith, Philadelphia, Pa., U. S.

## BOTTLED ALE.

*Report.*—The several samples submitted were all three perfect in color and brightness and very good in taste and aroma.

---

## 1642. W. A. Miles &amp; Co., New York, N. Y., U. S.

## BOTTLED ALE.

*Report.*—The two samples submitted were both perfect in color and brightness, excellent in aroma and taste.

## 1643. Reuter &amp; Alley, Boston, Mass., U. S.

BOTTLED ALE.

*Report.*—Perfect in color and brightness, very good in aroma, and excellent in taste.

## 1644. W. A. Miles &amp; Co., New York, N. Y., U. S.

PRESENT-USE ALE.

*Report.*—Perfection in every requisite of good ale, viz.: color, brightness, taste, and aroma.

## 1645. Henry Ferris &amp; Sons, New York, N. Y., U. S.

PRESENT-USE ALE.

*Report.*—Commended for perfection in color, brightness, and taste, and excellence in aroma.

## 1646. S. Bolton &amp; Son's Brewery, Lansingburgh, N. Y., U. S.

PRESENT-USE ALE.

*Report.*—Commended for excellence in color, brightness, and taste; very good in aroma.

## 1647. Beadleston, Price, &amp; Woerz, New York, N. Y., U. S.

PRESENT-USE ALE.

*Report.*—Commended for excellence in color, brightness, and taste; very good in aroma.

## 1648. Wm. Massey &amp; Co., Philadelphia, Pa., U. S.

PRESENT-USE ALE.

*Report.*—Commended for perfection in color; excellence in taste and aroma; very good in brightness.

## 1649. Herbert Wright &amp; Co., Moxton, near Dover, England.

ALE.

*Report.*—Commended for the excellent quality of their export pale ale, in every requisite of condition, brightness, and aroma.

## 1650. Richardson, Earp, &amp; Slater, Newark-upon-Trent, England.

ALE.

*Report.*—Commended for their A 1 ale; perfect in condition, and excellent in brightness and aroma.

## 1651. Ind, Coope, &amp; Co., Burton-on-Trent, England.

ALE.

*Report.*—Commended for the excellent quality of their "India Pale Ale" in every requisite of condition, brightness, taste, and aroma.

## 1652. Bindley &amp; Co., Burton-on-Trent, England.

ALE.

*Report.*—Commended for their mild ale, excellent in brightness, taste, aroma, and condition; and their strong ale is perfect in condition and brightness, and very good in taste and aroma.

## 1653. J. Muir &amp; Son, Edinburgh, Scotland.

## ALE.

*Report.*—Commended for the excellent quality of their sparkling ale, in every requisite of condition, brightness, and aroma.

---

## 1654. John Treacy &amp; Co., Geelong, Victoria, Australia.

## ALE AND STOUT IN BOTTLES.

*Report.*—The ale is sound and good for a light ale, and the porter of very good quality and well bottled.

---

## 1655. Edward Latham, Carlton, Victoria, Australia.

## ALE AND PORTER.

*Report.*—Several samples of ale, well brewed and in good condition, also of fine aroma. The porter is also of good quality.

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## 1656. P. J. Martin, Melbourne, Victoria, Australia.

## ALE.

*Report.*—This ale is brewed from Victorian malt and Tasmanian hops; is very fine, exceedingly well brewed, and of delicate flavor.

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## 1657. Henderson &amp; Fanan, Wellington, New Zealand.

## ALE AND STOUT.

*Report.*—Several samples, all showing good brewing, fair condition, careful treatment, and variety enough to suit all tastes.

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## 1658. Murree Brewery Co., Punjab, India.

## ALE.

*Report.*—Commended for the excellent quality of their strong ale and their XXX stout; remarkable for good condition, brightness, taste, and aroma.

---

## 1659. John Labatt, London, Ontario, Canada.

## ALE AND STOUT.

*Report.*—A variety of ale and stout. The latter, labeled XXX, was first-rate; the India pale ale, well brewed and very good; the ale on draught, well fermented and very good.

---

## 1660. Thos. Davies &amp; Brother, Toronto, Ontario, Canada.

## ALE AND PORTER.

*Report.*—A variety of brewings of ale and porter, of which the cream ale on draught was very good; the draught ale, very fair; the draught porter, good; and the cream crystal ale in bottles, fair.

---

## 1661. Cosgrove &amp; Co., Toronto, Ontario, Canada.

## BOTTLED ALE.

*Report.*—Excellent in color and brightness; very good in aroma and taste.

## 1662. Jansen &amp; Co., Lisbon, Portugal.

## ALE AND PORTER.

*Report.*—Light and agreeable good taste; well kept under the circumstances. Another sample much clearer, and even much better.

The porter of good taste and quality generally.

## 1663. A. B. Wallis, Dybeck, Malmo, Sweden.

## ALE.

*Report.*—Commended for good condition, having been well brewed, and for fair taste.

## 1664. A. H. Tulldahl, Landskrona, Sweden.

## ALE.

*Report.*—The pale ale being very good in condition, and fine in taste and flavor.

## 1665. Wm. Massey &amp; Co., Philadelphia, Pa., U. S.

## BOTTLED PORTER.

*Report.*—Commended for the excellent quality of bottled porter.

## 1666. William Massey &amp; Co., Philadelphia, Pa., U. S.

## AMERICAN STOCK PORTER.

*Report.*—Of good color, excellent taste, and fine aroma.

## 1667. John Gardiner &amp; Co., Philadelphia, Pa., U. S.

## PORTER.

*Report.*—Commended for excellence in taste, aroma, and brightness.

## 1668. Vincent Hathaway &amp; Co., Boston, Mass., U. S.

## GINGER ALE.

*Report.*—A very successful attempt to produce in this country what so far has been imported at much greater cost, but not much better quality.

## 1669. H. Paulding, Jr., Huntingdon, Long Island, N. Y., U. S.

## CHAMPAGNE CIDER.

*Report.*—Commended for very good quality, and for being a merchantable novelty in the way it is put up.

## 1670. T. &amp; H. Smith &amp; Co., Edinburgh, Scotland.

## AERATED GINGER BEER AND LEMONADE.

*Report.*—Commended for the following reasons:

1. Delicate and pleasant flavor.
2. Careful and successful preparation.

## 1671. Henry Reed &amp; Co., South Yarra, Victoria, Australia.

## LIME-JUICE CORDIAL.

*Report.*—The lime-juice cordial is excellent, and the taste and freshness of the fruit are wonderfully well preserved.

**1672. Emile Schmidt, Brussels, Belgium.**

## CORDIAL.

*Report.*—An aperient cordial called "Amer Belge," very fine

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**1673. Peter F. Heering, Copenhagen, Denmark.**

## CHERRY CORDIAL.

*Report.*—Very fine in taste; first quality in every particular.

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**1674. Juan Diaz, Valladolid, Spain.**

## CORDIALS.

*Report.*—Rosa anisada, a very good distilled spirit, of fine flavor and delicate composition.

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**1675. Vicente Ortega, Valencia, Spain.**

## CORDIALS.

*Report.*—Marasquino, of excellent taste and fineness; crème de café, a most exquisite cordial; both showing high perfection in the art of distillation.

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**1676. N. Raftopulos, Samos, Turkey.**

## CORDIAL.

*Report.*—Excellent cordial made of sage; of very good flavor, and tonic.

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**1677. Simon Baeza, City of Mexico, Mexico.**

## CORDIALS.

*Report.*—A very fine exhibit of cordials, well made, delicious in taste and color; very good.

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**1678. M. A. d'Oliveira Pinto, Matto Grosso, Brazil.**

## CORDIALS.

*Report.*—The exhibits are in a very good condition and carefully prepared.

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**1679. Braga Brothers & Co., Rio de Janeiro, Brazil.**

## CORDIALS AND LIQUORS.

*Report.*—Choicest cordials and strong liquors of various qualities, beautiful and delicious flavor; made with the greatest care.

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**1680. J. H. da Silva Rebello, Pará, Brazil.**

## CORDIAL.

*Report.*—Very delicious and fine cordial, prepared with the greatest care.

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**1681. M. Alves & Co., Rio de Janeiro, Brazil.**

## CORDIAL AND MARASCHINO.

*Report.*—A very fine assortment of choicest liquors and cordials, prepared with the greatest care, delicious, of fine quality.



## 1682. F. Viotti, Minas Geraes, Brazil.

## PEACH CORDIAL.

*Report.*—A very fine peach cordial, with delicious peach flavor.

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## 1683. J. J. A. Braz, São Paulo, Brazil.

## MANDARINO CORDIAL AND COGNAC.

*Report.*—Commended for fine quality, delicate flavor, strength, and cheapness.

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## 1684. F. P. Brandão, Rio de Janeiro, Brazil.

## COFFEE CORDIAL AND CHARTREUSE.

*Report.*—Excellent liquors; very well prepared, of fine quality, good bouquet, and very well conditioned.

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## 1685. J. do Amaral Rapozo, Pernambuco, Brazil.

## MANCA CORDIAL.

*Report.*—Excellent cordial, of very fine quality, delicious bouquet, good preparation, and in very good condition.

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## 1686. M. Rodriguez d'Oliveira, São Paulo, Brazil.

## CORDIALS.

*Report.*—An assortment of the choicest brands of cordials, such as anisette, pear cordial, pine-apple cordial, peach cordial, etc.; all very well prepared, and with exquisite flavors of the different fruits.

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## 1687. E. J. Pereira, Angra dos Reis, Brazil.

## LORIN CORDIAL.

*Report.*—A fine cordial made from the Brazilian indigenous plant Lorin; has a very fine taste, is of excellent quality and of first-class preparation.

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## 1688. Z. I. P. P. Requião, Paraná, Brazil.

## TEA CORDIAL.

*Report.*—Very good; prepared with the greatest care; with fine tea flavor, and in very good condition.

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## 1689. Agricultural Commission of Paraná, Brazil.

## ELICINA AMARGA.

*Report.*—A very good tonic liquor, made from Brazilian herbs; fine taste, good preparation, and kept in very good condition.

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## 1690. J. C. Belache, Paraná, Brazil.

## TEA CORDIAL.

*Report.*—An excellent tea cordial, with very pronounced tea flavor; of very good quality and good preparation.

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## 1691. A. J. R. d'Araujo, Rio de Janeiro, Brazil.

## TEA CORDIAL.

*Report.*—A liquor of delicious fine flavor, and very well prepared.

1692. Nicola Eboli, Bari, Italy.

CORDIAL.

*Report.*—A very fine collection of liquors, prepared with the greatest care; fine flavor, good quality, excellent condition, and very healthy.

1693. Pietro Rappis, Andorno, Italy.

RATAFIA, CORDIAL OF CHERRIES.

*Report.*—Very fine in taste and flavor; perfectly made, and a wholesome drink.

1694. Chev. Pasquale Montini, Milan, Italy.

CORDIALS.

*Report.*—An excellent cordial named "Victor Emanuel," made from pure aromatic herbs, and very wholesome.

1695. Francesco Savorini, Bologna, Italy.

CORDIAL (ANISETTE).

*Report.*—Very good and fine taste; carefully prepared.

1696. Chev. Andrea Torricelli, Florence, Italy.

CORDIAL.

*Report.*—The most agreeable and delicious alkermes known; well conditioned, of excellent quality, and deliciously good.

1697. Luigi Biseo & Co., Brescia, Italy.

CORDIALS.

*Report.*—A very good assortment, in particular the curaçao, which is excellent.

1698. Giuseppe Cassoni, Finale, Italy.

CORDIAL.

*Report.*—Coffee cream cordial, well prepared, of delicious taste, fine quality, and very wholesome.

1699. Dante Valiani, Pistoja, Italy.

ELIXIR LEDA.

*Report.*—A good liquor, well prepared, of agreeable taste, and wholesome.

1700. Giuseppe Calegari, Piacenza, Italy.

CORDIAL.

*Report.*—Vanilla cream cordial of very fine taste, excellent preparation, and in very good condition.

1701. Melloni Brothers, Piacenza, Italy.

CORDIAL.

*Report.*—Coca boliviana of very fine quality, extra good taste, well conditioned, and extremely wholesome.

## 1702. Marco Greco, Bologna, Italy.

## CORDIALS.

*Report.*—Very good orange cordial, delicious to the taste, and very well prepared.

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## 1703. Giulia Nazzari Vedova, Rome, Italy.

## CORDIALS.

*Report.*—Mandarino orange cordial, very excellent, and richly made up.

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## 1704. G. Buton &amp; Co., Bologna, Italy.

## CORDIALS.

*Report.*—The liquor called "coca boliviana," very good, is a specialty of the manufacturer; also the "aromatic eucalypto." Both very well preserved, and very agreeable to the taste.

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## 1705. Antonio Mossone, Andorno, Italy.

## RATAFIA CORDIAL.

*Report.*—An excellent drink, of delicious taste, well made, and very *recherché*.

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## 1706. G. Rubiolio, Andorno, Italy.

## RATAFIA CORDIAL.

*Report.*—Sweet, agreeable to the taste, and deliciously good; made from pure cherries.

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## 1707. Luigi Musi, Bologna, Italy.

## CORDIALS.

*Report.*—Good cordial, kummel, with excellent taste, fine quality, and of an extra good preparation.

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## 1708. Luciano Carpanetti, Bologna, Italy.

## CORDIALS.

*Report.*—A very good assortment of cordials of good perfume, particularly the rose cordials and the Chartreuse imitation, which are delicious.

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## 1709. Gio Batta Bellolli, Scandiano, Italy.

## CORDIAL.

*Report.*—Coffee cordial, very good, and of delicious taste.

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## 1710. Domenica Bellardi &amp; Co., Turin, Italy.

## CORDIALS AND FORESTA LIQUOR.

*Report.*—Excellent curaçao, and a large and very good collection of different liquors. The foresta liquor is delicious.

---

## 1711. Adolfo Mostardini, Florence, Italy.

## CORDIALS.

*Report.*—A very good collection of different liquors.

## 1712. Giovanni Profeta, Naples, Italy.

## CORDIALS.

*Report.*—A splendid liquor, deliciously good, and well conditioned.

---

## 1713. Luigi Ghizzoni &amp; Co., Piacenza, Italy.

## COFFEE CORDIAL AND COCA BOLIVIANA.

*Report.*—Very good cordials, and well prepared, excellent condition, and very agreeable to the taste.

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## 1714. Salvatore Ascione, Naples, Italy.

## KIRSCHENWASSER AND VANILLA CORDIAL.

*Report.*—Kirschenwasser good, but rather light flavor. Vanilla cordial good and strong.

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## 1715. Niccolò Zeni, Ferrara, Italy.

## COCA BOLIVIANA.

*Report.*—A very good drink, of fine taste, good quality, well prepared, and wholesome.

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## 1716. Domenico Vittone, Ditta, Milan, Italy.

## CORDIALS AND JERUSALEM BALM.

*Report.*—The firm exhibits a large variety of cordials. The prepared English punch deserves a special mention for its good quality, very good taste, and excellent condition. The Jerusalem balm is excellent.

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## 1717. Giuseppe Galimberti, Milan, Italy.

## COCA BOLIVIANA.

*Report.*—A very good and wholesome drink.

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## 1718. Costantino Clerici, Milan, Italy.

## VERMOUTH.

*Report.*—Very good; carefully prepared; well flavored; in good condition.

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## 1719. Commendatore G. Bon Gagliasso, Turin, Italy.

## VERMOUTH.

*Report.*—Very good quality of Vermouth, prepared with great taste; of fine bouquet, and kept in excellent condition.

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## 1720. Giovanni Cavallone, Crescentino, Italy.

## VERMOUTH.

*Report.*—A good tonic drink; well prepared, in excellent condition, and of very fine bouquet.

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## 1721. Domenico Vittone, Milan, Italy.

## VERMOUTH.

*Report.*—A good tonic drink, prepared with great care, and in very good condition.

## 1722. Vittorio Rossi, Alessandria, Italy.

## VERMOUTH.

*Report.*—Very good, of fine bouquet, and kept in very good condition.

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## 1723. Francesco Cinzano &amp; Co., Turin, Italy.

## VERMOUTH.

*Report.*—Vermouth made from white wine; of very delicate flavor; good quality; prepared with the greatest care.

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## 1724. Martini Solà &amp; Co., Turin, Italy.

## VERMOUTH.

*Report.*—A tonic wine; well made; of full flavor.

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## 1725. Jorge Hanot, Buenos Ayres, Argentine Republic.

## AZAHAR (ORANGE-FLOWER) WATER AND CORDIALS.

*Report.*—The orange-flower water, from the Paraná islands, is of a very delicate natural flavor. The "herman liquor," a very finely composed cordial, and the "Chartreuse," are of the best imitations of that celebrated liquor ever presented.

---

## 1726. Antonio Dalbello, Spalato, Dalmatia, Austria.

## CORDIAL CALLED "MARASCHINO."

*Report.*—Very fine liquor, recommending itself. Its delicate and nice flavor could not be surpassed; high standard.

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## 1727. Kohler &amp; Frohling, San Francisco, Cal., U. S.

## AMERICAN STILL WINES.

*Report.*—Commended for their brand of still wines; "Rose of Peru" being very good in condition, flavor, taste, and general composition; also for their "Riesling," for the same reasons; also for their "dry Muscatel of 1872," being good in taste, and very good in condition, flavor, and general composition; also for the good qualities of their "port" labeled "Superior, 1865;" also for their "sweet Muscat of 1868 and 1872," excellent in condition, and very good in every other requisite; and for their "Angelica," excelling in the same qualities.

---

## 1728. Kelley's Island Wine Co., Kelley's Island, Ohio, U. S.

## WINE.

*Report.*—"Still Catawba of 1871;" very good in condition, flavor, taste, and general composition; also their "Delaware," very good in condition, taste, and composition, and good in flavor; also their "Ives' seedling," very good in every essential quality.

---

## 1729. Buena Vista Vincultural Society, Sonoma, Cal., U. S.

## WINES.

*Report.*—Commended for their "red dry wine," being very good in every requisite of a wine of that character.

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## 1730. M. Keller &amp; Co., Los Angeles, Cal., U. S.

## WINE.

*Report.*—Commended for the good quality of their brand of "Angelica" wine.

## 1731. Pleasant Valley Wine Co., Hammondsport, N. Y., U. S.

## WINE.

*Report.*—Two brands of sparkling wine, named "Great Western" and "Carte Blanche;" very excellent in condition, taste, flavor, and composition.

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## 1732. Kelley's Island Wine Co., Kelley's Island, Ohio, U. S.

## WINE.

*Report.*—Sparkling wine called "Island Queen;" very excellent in condition, taste, flavor, and composition.

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## 1733. Urbana Wine Co., Hammondsport, N. Y., U. S.

## STILL AND SPARKLING WINES.

*Report.*—Commended for their still wine from the "Norton's Virginia seedling" grape; being very good in condition, flavor, and composition. Also for a variety of sparkling wines, of which the "extra dry golden seal," the "golden seal," and the "Delaware," are very excellent in condition and very good in taste and composition.

---

## 1734. J. W. Gilbert, St. Augustine, Fla., U. S.

## ORANGE WINE.

*Report.*—A successful effort to utilize the juice of the orange when not otherwise to be disposed of. A still further improvement might be obtained by neutralization of part of the superabundant acidity of the wine.

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## 1735. N. H. Moragne, Palatka, Fla., U. S.

## ORANGE WINE.

*Report.*—A very palatable and carefully made article from the pure juice of orange. An industry deserving to be encouraged for the purpose of utilizing an abundant orange crop when otherwise not marketable.

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## 1736. F. A. Goetze, Jersey City, N. J., U. S.

## STILL WINE.

*Report.*—"Concord" and "Clinton" wines, of several vintages, commendable for good treatment and fair condition, showing to the best advantage what wines can be produced from the grapes named.

---

## 1737. M. Poeschel &amp; Scherer, Hermann, Mo., U. S.

## WINE.

*Report.*—Commended for their still wine, made from the "Clinton" grape, being very good in condition, flavor, taste, and general composition; also for their "Ives' seedling," being excellent in condition and very good in every other requisite; also for their "Martha," being excellent in condition and very good in taste and composition; the same also for their "Taylor."

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## 1738. Alfred Speer, Passaic, N. J., U. S.

## WINE.

*Report.*—Commended for the very good quality of his wine labeled "Blackberry Wine."

## 1739. A. F. Brecht, Philadelphia, Pa., U. S.

## RIESLING AND MUSCATEL WINE.

*Report.*—Commended for the good quality, in every requisite, of his “Riesling, 1865,” and “Muscatel” still wines.

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## 1740. Julius Hincke, Egg Harbor City, N. J., U. S.

## WINE.

*Report.*—Commended for the very good quality of his still wines branded “Jolhink,” 1872 and 1870.

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## 1741. Charles Le Franc, San José, Cal., U. S.

## WINE.

*Report.*—Commended for his “New Almaden” still white wine of 1868, being very good in every requisite of a wine of that character; and also for his white wine of 1871, being excellent in every respect.

---

## 1742. H. M. Naglee, San Bernardino County, Cal., U. S.

## WINE.

*Report.*—Still “Cucomonge” wine, vintage 1862; excellent in condition and flavor; commended for its purity and very good taste.

---

## 1743. Perkins, Stern, &amp; Co., San Francisco, Cal., and New York, N. Y., U. S.

## WINE.

*Report.*—Their “claret” is very good in every quality requisite for a wine of that character.

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## 1744. Gustave de Mahé, San Mateo, Cal., U. S.

## GOLDEN WINE.

*Report.*—A special sound wine, of different vintages, called “golden wine,” from California growths; palatable, good, and cheap.

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## 1745. Ohio Valley Wine Co., Evansville, Ind., U. S.

## SPARKLING WINE.

*Report.*—Commended for their brand “Imperial,” which was very good in condition, taste, flavor, and general composition.

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## 1746. Pleasant Valley Wine Co., Hammondsport, N. Y., U. S.

## WINE.

*Report.*—Still wine made from the Catawba grape, being very good in taste, flavor, and general composition, and excellent in condition.

---

## 1747. John A. Huck, Chicago, Ill., U. S.

## WINE.

*Report.*—Commended for the very good qualities of his “Delaware,” in respect to condition, flavor, taste, and composition.

## 1748. Werk &amp; Son, Cincinnati, Ohio, U. S.

## WINE.

*Report.*—Commended for their sparkling wines, of which the Catawba was perfect in condition and excellent in taste, flavor, and composition; and also their sparkling "Delaware," for excellence in condition and all other requisites.

## 1749. M. Werk &amp; Sons, Cincinnati, Ohio, U. S.

## STILL WINE.

*Report.*—Commended for their dry Catawba of 1853, being very good in condition and flavor, and good in taste; also for their "Delaware," excellent in condition, and very good in every other quality; also for their "Norton's Virginia seedling," very good in condition, taste, flavor, and general composition.

## 1750. T. H. Johnson, Bricksburg, N. J., U. S.

## UNFERMENTED WINE.

*Report.*—An article well calculated to satisfy the requirements of a wine containing no alcohol.

## 1751. Wehrle, Werk, &amp; Son, Middle Bass Island, Ohio, U. S.

## WINE.

*Report.*—Commended for the excellent quality of their still wines from the Catawba and Delaware grapes, and from both combined; also for their Concord of 1874, and the very good quality, in every requisite of wines of that character, of their "Norton's Virginia seedling."

## 1752. William H. Mills, Sandusky, Ohio, U. S.

## WINE.

*Report.*—A variety of sparkling wines, of which the brand "Le Diamant" was perfect in condition and excellent in taste, flavor, and composition.

The "Sanspareil" commended as excellent in condition, and very good in every other requisite.

## 1753. American Wine Co., St. Louis, Mo., U. S.

## WINE.

*Report.*—Commended for their brands of sparkling "Imperial," vintages of 1873 and 1874; nearly perfect in condition, and excellent in taste, flavor, and composition.

## 1754. Charles Brasche, Sunbury, Melbourne, Victoria, Australia.

## AUSTRALIAN WINES.

*Report.*—Commended for very good style and elegance.

## 1755. Charles Mapleston, Heidelberg, Melbourne, Victoria, Australia.

## AUSTRALIAN WINES.

*Report.*—Commended for the superior quality of his "Riesling," which showed in a pleasant way the flavor of this grape.



**1756. F. Egli, Tabilk, Seymour, Victoria, Australia.**

AUSTRALIAN WINES.

*Report.*—Commended for the good quality of his wine which showed careful treatment and good culture.

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**1757. Frederick Grasse, Strathfieldsaye, Victoria, Australia.**

AUSTRALIAN WINES.

*Report.*—Commended for good quality and style.

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**1758. St. Hubert's Vineyard Co., Yering, Melbourne, Victoria, Australia.**

AUSTRALIAN WINES.

*Report.*—Commended for the pleasant style of the "Riesling" produce.

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**1759. J. S. Johnston, Sunbury, Melbourne, Victoria, Australia.**

AUSTRALIAN WINES.

*Report.*—Commended for good quality.

---

**1760. Bear & Ford, Tabilk, Seymour, Victoria, Australia.**

AUSTRALIAN WINES.

*Report.*—The wine was found clear and palatable, of a fine bouquet.

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**1761. Otto Jung, Castlemaine, Victoria, Australia.**

WINES.

*Report.*—A fine, full-bodied Hermitage, 1871, of good condition.

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**1762. Joseph Best, Great Western, Victoria, Australia.**

WINES.

*Report.*—The Hermitage, 1871, was found full in body and elegant in style.

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**1763. Franz Schmitt, Berwick, Melbourne, Victoria, Australia.**

AUSTRALIAN WINES.

*Report.*—Commended for the very superior quality of the Riesling.

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**1764. Carl Pohl, Strathfieldsaye, Sandhurst, Victoria, Australia.**

AUSTRALIAN WINES.

*Report.*—Commended for good condition and quality.

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**1765. Fabrizio Crippa, Hepburn, Victoria, Australia.**

WINES.

*Report.*—Commended for the fine flavor, color, and taste of his Hermitage, 1871.

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**1766. G. S. Smith, Wahgunah, Melbourne, Victoria, Australia.**

AUSTRALIAN WINES.

*Report.*—Commended for the elegance of a rich dessert wine.

1767. Samuel Davenport, Adelaide, South Australia, Australia.

WINES.

*Report.*—Commended for the good condition, clean taste, and pleasant style of some Beaumont wines.

1768. Jos. Gilbert, Pernsey Vale, South Australia, Australia.

WINE.

*Report.*—Commended for the good quality and pleasant style of some Riesling wines.

1769. Thos. Hardy, Adelaide, South Australia, Australia.

WINES.

*Report.*—Commended for the good quality of different wines.

1770. Alex. C. Kelly, Adelaide, South Australia, Australia.

WINES.

*Report.*—Commended for the good flavor and quality of 1873 claret.

1771. G. F. Ind, Adelaide, South Australia, Australia.

WINES.

*Report.*—Commended for the good quality and condition of a Shiraz and Madeira, 1872 vintage.

1772. Edward Thornber, Adelaide, South Australia, Australia.

WINES.

*Report.*—Commended for the excellent rich style and quality of a Pedro Ximenes, 1871 vintage.

1773. J. W. Weight, Adelaide, South Australia, Australia.

WINES.

*Report.*—Commended for the good quality of 1873 Muscatel.

1774. J. D. Holbrook, Adelaide, South Australia, Australia.

WINE.

*Report.*—Commended for the good quality of a sherry wine; rich in body, pleasant in style.

1775. Jos. Gillard, Adelaide, South Australia, Australia.

WINES.

*Report.*—Commended for the superior quality, good condition, and style of a Frontignac, 1874 vintage.

1776. John H. Kaines, Adelaide, South Australia, Australia.

WINES.

*Report.*—Commended for the good quality and condition of an 1871 vintage Verdeilho.

1777. R. D. Ross, Adelaide, South Australia, Australia.

WINES.

*Report.*—Commended for good quality.

## 1778. J. M. Richmann, Adelaide, South Australia, Australia.

## WINES.

*Report.*—Commended for the good quality of an 1870 and 1871 vintage Grenache, and 1870 Shiraz.

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## 1779. C. A. Hornbrook, Adelaide, South Australia, Australia.

## WINES.

*Report.*—Commended for the good quality of a "Palomino blanco," 1867 vintage.

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## 1780. George White, Adelaide, South Australia, Australia.

## WINES.

*Report.*—Commended for the good quality and condition of an 1871 vintage Pedro Ximenes, and of a Pommard.

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## 1781. Isabella Baker, Adelaide, South Australia, Australia.

## WINE.

*Report.*—Commended for the superior quality and style of some Monalta wines.

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## 1782. Patrick Auld, Adelaide, South Australia, Australia.

## WINES.

*Report.*—Commended for the good quality of some Auldana wines exhibited.

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## 1783. W. Salter &amp; Son, Adelaide, South Australia, Australia.

## WINES.

*Report.*—A very superior liqueur-wine, 1870; vintage Shiraz.

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## 1784. Commissioners of South Australia, Australia.

## WINES.

*Report.*—A selected assortment of the best Australian wines, among which some "Riesling," "Frontignac," "Monalta," and "Port" wines, and particularly of 1870 vintage "Ardeilha," were found superior, giving proof of a continued improvement in the culture of vineyards and of wines.

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## 1785. Henry Foot, Adelaide, South Australia, Australia.

## WINES.

*Report.*—Some of the Riesling wines were found superior in flavor and good in style and condition.

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## 1786. J. P. Cloete, Cape of Good Hope.

## WINES.

*Report.*—Very pure, of good taste and aroma.

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## 1787. Dr. Hauf, Cape of Good Hope.

## WINES AND BRANDY.

*Report.*—Muscatel wine very good; also a very fine sample of grape brandy, fine aroma and very clean spirit.

## 1788. Anderson &amp; Murison, Cape of Good Hope.

## WINES.

*Report.*—Of very good taste and aroma.

---

## 1789. S. Van Remen, Cape of Good Hope.

## WINES.

*Report.*—Red and white wines; very pure, of good taste and fine aroma.

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## 1790. E. K. Greene, Cape of Good Hope.

## WINES.

*Report.*—Very fine assortment of dry and sweet red wines; of good taste and aroma.

---

## 1791. Cloete Brothers, Cape of Good Hope.

## WINES.

*Report.*—Very fine; of good taste and aroma.

---

## 1792. James T. Fallon, Albury, New South Wales, Australia.

## AUSTRALIAN WINES.

*Report.*—Commended for the fine flavor and good style of some of the samples submitted.

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## 1793. Carl J. P. Brecht, Rosemount, Denmann, New South Wales, Australia.

## AUSTRALIAN WINES.

*Report.*—Commended for the good style and quality of the Muscatel and Riesling.

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## 1794. Alexander Munro, Singleton, New South Wales, Australia.

## AUSTRALIAN WINES.

*Report.*—Commended for the very fine condition of his light-bodied wines.

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## 1795. Wadham Wyndham, Bukkulla, New South Wales, Australia.

## AUSTRALIAN WINES.

*Report.*—Commended for good condition and quality.

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## 1796. J. F. Doyle, Kaludah, New South Wales, Australia.

## AUSTRALIAN WINES.

*Report.*—Commended for good quality and condition, showing the careful treatment of the wines.

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## 1797. James Smith, Nelson, New Zealand.

## FRUIT-WINES FROM GOOSEBERRIES, APPLES, PLUMS, CHERRIES, ETC.

*Report.*—Wines from several fruits and berries, well blended and composed, very tasteful and palatable, and kept in excellent condition.

## 1798. V. Casci, St. Vincent, Toronto, Canada.

## CHERRY WINE.

*Report.*—Good quality, fine bouquet, and carefully prepared.

---

## 1799. Agnew L. Farrell, Cayuga, Ontario, Canada.

## HERMITAGE WINES.

*Report.*—Very good wine, with very fine bouquet; of good quality, and well conditioned.

---

## 1800. James Hustings, White Church, Canada.

## WINE.

*Report.*—Of good quality, excellent bouquet, and kept in very good condition.

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## 1801. D. Nixon, Allisonville, Ontario, Canada.

## WINE.

*Report.*—Good sweet wine of excellent quality, delicious flavor, and very well conditioned.

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## 1802. Michael Zyzykin, Moscow, Russia.

## WINE AND LIQUORS.

*Report.*—Samples of sparkling white wines, imitating French champagnes; nice bouquet, well prepared, and cheap. Also, a good assortment of various liquors distilled with clean spirit.

---

## 1803. Prince Simon Worontzof, Massandra and Aidanil, Crimea, Russia.

## WINE.

*Report.*—A great collection of red and white wines, grown on his estate, resembling the French wines; good color, and uncommonly cheap.

---

## 1804. Antonine Kniajevitch, Alushta, Crimea, Russia.

## WINE.

*Report.*—Good sound red and white wines, grown on his own vineyard, and obtainable at very cheap rates.

---

## 1805. Nicolas Rajevsky, Crimea, Yalta, Russia.

## WINES.

*Report.*—Good sound red and white wines, which can be bought at very low prices.

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## 1806. A. Stempkowsky, Warsaw, Russia.

## WINE.

*Report.*—Samples of the celebrated wine "Miod," vintage 1777; samples of old brandy distilled in Poland, vintage 1790; very remarkable specimens.

---

## 1807. Robert Lanski, Soodak, Crimea, Russia.

## WINE.

*Report.*—Samples of red and white wines, grown in the Crimea; sound, and obtainable at very cheap rates.

## 1808. John Fundoocley, Goorsoof, Crimea, Russia.

## WINES.

*Report.*—Very good specimens of red and white wines, grown on his vineyard; nice color, good condition, and sold at very cheap rates.

---

## 1809. David Doolvetof, Simpheropol, Crimea, Russia.

## WINES.

*Report.*—A good collection of red and white wines, grown on his own estate; good color, fruity.

---

## 1810. Imperial Nikitzky Garden, Yalta, Crimea, Russia.

## WINES.

*Report.*—A large assortment of white and red Muscatel wines; of ordinary red and white wines, grown on the vineyard; sound and fruity.

---

## 1811. Jules Clavelle, Bordeaux, France.

## WINES.

*Report.*—Samples of sound and full-flavored red and white wines of the first, second, and third growths, and bottled in good condition.

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## 1812. Charles Irroy &amp; Co., Reims, France.

## WINE.

*Report.*—An elegant, agreeable, sparkling wine; well prepared, carefully shipped, satisfactory in every respect.

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## 1813. Mestrezat &amp; Co., Bordeaux, France.

## WINE.

*Report.*—The red and white wines exhibited by Messrs. Mestrezat & Co., composed of the first, second, and third growths, are of a very good quality and style.

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## 1814. A. Dufour &amp; Co., Bordeaux, France.

## WINES.

*Report.*—Samples of ordinary red wines, good quality and color, obtainable at very low prices.

---

## 1815. Guichard-Potheret Son, Châlons-sur-Saône, France.

## WINES.

*Report.*—Samples of red and white Burgundy wines of various growths; very commendable as regards quality and bouquet.

---

## 1816. Fisse, Thirion, &amp; Co., Reims, France.

## WINE.

*Report.*—Good sparkling wine, well worked up.

## 1817. Segnouret Brothers, Bordeaux, France.

## WINES.

*Report.*—Samples of red and white wines of the first, second, and third growths; very sound, and bottled in very good condition.

## 1818. Jules Merman &amp; Co., Bordeaux, France.

## WINE.

*Report.*—Samples of Sauterne white wines (La Tour blanche de la Brock), delicate and highly flavored, of a good quality, and obtainable at moderate prices. Samples of red wines of good quality.

## 1819. Jules Tournier, Epernay, France.

## WINE.

*Report.*—Palatable sparkling wine, worked up according to general rules.

## 1820. Fortuné Beaucourt, Margaux, France.

## WINE.

*Report.*—Very good sound red wines, which have been grown on M. Fortuné Beaucourt's estate (Château de la Bigorée), and which can be obtained at cheap rates.

## 1821. Jules Barral, Frontignan, France.

## WINE.

*Report.*—Sample of good Frontignan wine, or Muscatel; nice bouquet and good condition.

## 1822. De Montigny &amp; Co., Reims, France.

## WINE.

*Report.*—Genuine sparkling wine, worked up under good condition; agreeable to the palate.

## 1823. Joseph Perrier Son &amp; Co., Châlons-sur-Marne, France.

## WINE.

*Report.*—Good natural still wine, well worked up, giving satisfaction.

## 1824. De Lossy, Reims, France.

## WINE.

*Report.*—Sound sparkling wine, nicely prepared and palatable.

## 1825. Madame Cécile Rhoné, Bordeaux, France.

## WINE.

*Report.*—Madame Rhoné has sent samples of the red wines grown at Château Rauzan, her estate in the Médoc district; elegant and fruity wines.

## 1826. A. Passier, Sautenay, France.

## WINES.

*Report.*—Samples of various growths of Burgundy wines; superior as regards quality, flavor, and body.

## 1827. Baron Sarget de la Fontaine, Bordeaux, France.

## WINES.

*Report.*—The samples of the red wines of the vineyard Gruaud-Larose are irreproachable as regards quality and delicacy.

---

## 1828. A. Fournier, Château de Figeac, Saint-Emilion, France.

## WINES.

*Report.*—Very good specimen of stout, useful wines, which can be imported at a moderate figure

---

## 1829. Lefèvre &amp; Remondet, Savigny-les-Beaune, France.

## WINES.

*Report.*—An assortment of red and white Burgundy sparkling wines, very elegantly prepared, and delicate in flavor.

---

## 1830. J. D. Becker Son, Bordeaux, France.

## WINES.

*Report.*—Samples of Sauterne white wines, which are good, sound, nicely flavored, and obtainable at reasonable prices.

---

## 1831. Cunliffe, Dobson, &amp; Co., Bordeaux, France.

## WINES.

*Report.*—Samples of red and white wines of the first, second, and third growths; of a superior quality, delicate in flavor, and bottled in a very good condition.

---

## 1832. Justin Promis, Bordeaux, France.

## WINE.

*Report.*—Samples of stout and sound red wines grown on his vineyard of Blanquefort, and of white Sauterne wines, equally good, and obtainable at moderate prices.

---

## 1833. Charles Victoir &amp; Co., Epernay, France.

## WINES.

*Report.*—Good, palatable wine, well prepared, and sold at moderate prices.

---

## 1834. Jérôme Chiapella, Bordeaux, France.

## WINE.

*Report.*—A very good sample of red wine, grown on M. Chiapella's estate; stout, rich in flavor, and of superior quality.

---

## 1835. Charles Benoit Son, Reims, France.

## WINE.

*Report.*—A good sound wine, nicely prepared, and worked up in good condition.

---

## 1836. Alfred de Montebello &amp; Co., Mareuil-sur-Ay, France.

## WINE.

*Report.*—A wine composed of first-rate grades, worked up carefully, and giving every satisfaction.



## 1837. Isaac Pereire, Margaux, France.

WINES.

*Report.*—First-class wines.

## 1838. Renaudin, Bollinger, &amp; Co., Ay, Champagne, France.

WINE.

*Report.*—A sparkling wine made from superior grapes, well flavored, palatable, and giving every satisfaction.

## 1839. Reignard, Paris, France.

WINE.

*Report.*—A specimen of a superior fruity and stout wine, grown on his estate of Carton. A first growth in the Burgundy district.

## 1840. E. Thoreau &amp; Son, Château de la Chêze, near Saumur, France.

WINE.

*Report.*—Sparkling wine, known as "Vin de Saumur;" of very good quality, considering its cheapness.

## 1841. Théophile Rœderer &amp; Co., Reims, France.

CHAMPAGNE.

*Report.*—Sparkling white wines; good and palatable.

## 1842. De Venoge &amp; Co., Epernay, France.

CHAMPAGNE.

*Report.*—Sound, good, sparkling wine; shipped in proper condition; quite palatable.

## 1843. Roussillion, Epernay, France.

CHAMPAGNE.

*Report.*—Sparkling, palatable wine; put up in a very satisfactory way.

## 1844. J. Barrat, Epernay, France.

CHAMPAGNE.

*Report.*—A good, sparkling wine; worked up in good condition, and obtainable at a cheap rate.

## 1845. De Launay &amp; Co., Paris, France.

CHAMPAGNE.

*Report.*—Sound, sparkling wine; in good condition, and cheap.

## 1846. E. Mercier, Epernay, France.

CHAMPAGNE.

*Report.*—A genuine sparkling wine; palatable, and well prepared for shipping.

## 1847. Charles Farre, Reims, France.

CHAMPAGNE.

*Report.*—Sound, sparkling wines; worked up with care.

## 1848. S. Vinyas, Reims, France.

## CHAMPAGNE.

*Report.*—A good, sound, sparkling wine; carefully prepared, and palatable.

---

## 1849. Bourgoin-Jomain Son, Beaune, France.

## WINES.

*Report.*—Samples of Romanei and Chambertin wines; superior in quality, richness, and flavor.

---

## 1850. G. de Beuverand &amp; R. de Poligny, Chassagne, France.

## WINES.

*Report.*—Samples of very superior red Burgundy wines of the first growths; rich and elegant.

---

## 1851. Edmond Naigeon, Beaune, France.

## WINES.

*Report.*—A very good assortment of red Burgundy wines, rich and stout; and sparkling wines of the same character, elegant and nicely prepared.

---

## 1852. Ferret Brothers &amp; Co., Macon, France.

## WINES.

*Report.*—A very good collection of full-flavored, stout red and white Burgundy wines, which can be imported at moderate prices.

---

## 1853. Madame de Errazu, Bordeaux, France.

## WINE.

*Report.*—A red wine of a first growth; perfect as regards quality and flavor.

---

## 1854. Bonton Son, Bordeaux, France.

## WINES.

*Report.*—A collection of good, stout, useful red and white wines, which are sold at very low prices.

---

## 1855. Giojuzza, Giobertini &amp; Co., Paris, France.

## WINE FROM MARSALA AND SYRACUSE, SICILY.

*Report.*—Commended for the following reasons:—1. Excellence of bouquet and taste. 2. Splendid appearance for a Marsala and Syracuse. 3. Price very reasonable. 4. Superiority, especially for hygienic purposes, on account of natural strength obtained from the grape without addition of alcohol.

---

## 1856. De Ricaumont &amp; Co., Libourne, near Bordeaux, France.

## WINES.

*Report.*—Samples of red wines of the best growths; good quality; nice bouquet; very good for the price.

## 1857. Paul Chenu, Laffite, &amp; Co., Bourg, France.

## WINES.

*Report.*—A very good selection of Leoville and Saint-Julien red wines; stout and rich in color, and obtainable at moderate figures.

---

## 1858. J. L. Garros, Bordeaux, France.

## WINES.

*Report.*—A good selection of red and white wines of the first, second, and third growths; sound, full-flavored, and obtainable at very reasonable figures.

---

## 1859. De Bousquet, Montferrand, near Bordeaux, France.

## WINES.

*Report.*—Samples of sound, useful red wines, obtainable at moderate figures.

---

## 1860. Gustave Roy, Médoc, France.

## WINES.

*Report.*—A very good specimen of the wines grown on M. Roy's estate, of superior quality and delicate in flavor.

---

## 1861. Santarelli Brothers, Jerez de la Frontera, Spain.

## WINES.

*Report.*—Wine Amontillado, of full flavor, in good condition, and of fine bouquet. Wine called Pedro Ximenes, of sweet and delicious flavor.

---

## 1862. Pedro Caselles &amp; Co., Reus, Tarragona, Spain.

## WINE.

*Report.*—A table wine, very cheap, and in good condition.

---

## 1863. Federico Rudolph, Cadiz, Spain.

## WINES.

*Report.*—Excellent dry and sweet sherries, which are very cheap and good.

---

## 1864. Gonzalez, Biass, &amp; Co., Jerez de la Frontera, Cadiz, Spain.

## WINES.

*Report.*—An excellent collection of sherry wines, some of them very old.

---

## 1865. Duff Gordon &amp; Co, Port St. Mary's, Spain.

## SHERRY WINES.

*Report.*—Excellent pale sherry wines.

---

## 1866. Juan Pablo Lacaze, Zaragoza, Spain.

## WINE.

*Report.*—Very strong wine; used for mixing.

**1867. Antonio Castell de Pons, Esparraguera, Barcelona, Spain.**

WINE.

*Report.*—White wine for table purposes; well flavored, and very cheap.**1868. Eduardo Diaz, Huelva, Spain.**

WINE.

*Report.*—A very good strong and sweet white wine, highly recommended for its good qualities.**1869. Roca Brothers, Murcia, Spain.**

WINE.

*Report.*—A very well prepared white wine, remarkably cheap.**1870. Silva & Aros, Espartina, Seville, Spain.**

RED WINE.

*Report.*—Very pure, of good taste and flavor, and in good condition.**1871. Joaquin Bueno & Co., Malaga, Spain.**

WINES.

*Report.*—Commended for the very good quality of their sweet and dry Malaga wines.**1872. Marcial Verdu, Monovar, Alicante, Spain.**

WINES.

*Report.*—Good red wines.**1873. Pereira & Sons, Sagunto, Valencia, Spain.**

RED WINE.

*Report.*—Of very good taste and fine condition.**1874. Manuel Sotillo, Valladolid, Spain.**

WINES.

*Report.*—Very good red and white wines.**1875. Lorenzo Fernandez Munoz, San Juan (Alicante), Spain.**

WINES.

*Report.*—Good red wines.**1876. Juan R. Modenes, Baena, Cordova, Spain.**

WINES.

*Report.*—Very good dry pale Montilla wines.**1877. Mateo Salvado, Rindoms, Tarragona, Spain.**

WINE.

*Report.*—A sound table wine. It is very cheap, and in very good condition.

## 1878. Ignacio Hortal, Fregeneda, Salamanca, Spain.

WINE.

*Report.*—A good white wine, which is raised in a province where it is very difficult to raise fine wine.

---

## 1879. Julio Licktenstein, Zaragoza, Spain.

WINE.

*Report.*—Sweet wine called "Cariniena;" strong, agreeably sweet, and highly flavored.

---

## 1880. Sebastian Garcia, Scala Dei, Tarragona, Spain.

WINE.

*Report.*—A very superior wine called "dry Malvasia;" exceedingly bright and dry; highly flavored, very cheap, and in the best condition.

---

## 1881. Juan Gatell y Folch, Altafulla, Tarragona, Spain.

WINE.

*Report.*—"Malvasia" of very good quality and agreeable taste, and in very good condition.

---

## 1882. Mariano Gisbert, Torrente, Valencia, Spain.

WINE.

*Report.*—A very well made wine and pleasant to the palate, quite unique in its class, called "Abocado."

---

## 1883. José Pla Costa, Olleria, Valencia, Spain.

WINE.

*Report.*—A full-bodied wine, at a very low price.

---

## 1884. Vicente Lassala, Llano de Cuarte, Valencia, Spain.

WINE.

*Report.*—Good wine for exportation; very cheap.

---

## 1885. Manuel Liendo, Gines, Seville, Spain.

WINES.

*Report.*—Aromatic and excellent dry Montillas.

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## 1886. Francisco Puig Descals, Rosas, Girona, Spain.

WINE.

*Report.*—A well-made and aromatic sweet wine, highly recommended for its qualities.

---

## 1887. A. Abello &amp; Son, Reus, Tarragona, Spain.

WINES.

*Report.*—Good dry and sweet red wines, for exportation.

1888. Pedro Caselles & Co., Reus, Tarragona, Spain.

WINES.

*Report.*—Good red wines and imitations of port.

---

1889. José Boulé, Reus, Tarragona, Spain.

WINES.

*Report.*—Very good sweet wines.

---

1890. Le Brun & Co., Orotava, Canary Islands.

WINES.

*Report.*—Excellent sweet wines.

---

1891. Carpenter & Co., Orotava, Canary Islands.

WINES.

*Report.*—Excellent sweet wines.

---

1892. Vicente Lasala y Palomares, Llano de Cuarte, Valencia, Spain.

WINES.

*Report.*—Good sweet white wines.

---

1893. Pablo Sardá, Tarragona, Spain.

WINES.

*Report.*—Commended for the excellent quality of his red Priorate wines.

---

1894. Laureano Ballester y de Torres, Mediona, Barcelona, Spain.

WINES.

*Report.*—Good sweet wines.

---

1895. Joaquin Pedrosa de Castell de Mas, Esparraguera, Barcelona, Spain.

WINES.

*Report.*—Good sweet wines.

---

1896. Antonio Llampallas, Masnou, Barcelona, Spain.

WINES.

*Report.*—Very good old dry red wines.

---

1897. Soberano & Co., Reus, Tarragona, Spain.

WINES.

*Report.*—Very good sparkling wines.

---

1898. Pedro Gras, Reus, Tarragona, Spain.

WINES.

*Report.*—Commended for the good quality of his red and white Catalan wines.

---

1899. Antonio Maria Llobet & Co., Barcelona, Spain.

WINES.

*Report.*—Excellent sparkling wines.

1900. Joaquín Hontoria y Tezanos, San Lucar, Cadiz, Spain.

WINES.

*Report.*—Very aromatic Manzanilla sherry and sweet wines.

---

1901. José María Pico, Puerto de Santa María, Cadiz, Spain.

WINES.

*Report.*—Good dry and sweet sherries.

---

1902. José Bonaventura Puig, Sitjes, Barcelona, Spain.

WINES.

*Report.*—Excellent Muscatel wines.

---

1903. Francisco Alvear y Ward, Montilla, Cordova, Spain.

WINES.

*Report.*—Very good dry Montilla wines.

---

1904. Federico Molina, Rociana, Huelva, Spain.

WINES.

*Report.*—Very good dry pale Manzanilla wines.

---

1905. Pedro Ignés, Cervera, Lérida, Spain.

WINES.

*Report.*—Good sweet wines, called "Garnacha."

---

1906. José Rodríguez y Rodríguez, Trigueros, Huelva, Spain.

WINES.

*Report.*—Good dry pale Manzanilla wines.

---

1907. Pío Simo, Porrera, Tarragona, Spain.

WINES.

*Report.*—Very good dry white wines.

---

1908. Eliezer Montiel, Trigueros, Huelva, Spain.

WINES.

*Report.*—Good dry pale Manzanilla wines.

---

1909. José Iniguez, Gibraleón, Huelva, Spain.

WINES.

*Report.*—Good white dry Amontillado wines.

---

1910. José Calvo Rubio, Aguilar, Cordova, Spain.

WINES.

*Report.*—Excellent dry pale Montilla wines.

## 1911. Marques de Benamejis, Valdepeñas, Spain.

WINES.

*Report.*—Excellent red Valdepeñas wines.

## 1912. Marques de Viesca de la Sierra, Tregeneda, Salamanca, Spain.

WINES.

*Report.*—Good dry and sweet red wines.

## 1913. Pedro Lopez, Cordova, Spain.

WINES.

*Report.*—Very good and cheap Montilla wines.

## 1914. José Valle Valenzuela, Lucena, Cordova, Spain.

WINES.

*Report.*—Very good dry pale Montilla wines.

## 1915. Antonio Canela, Lucena, Cordova, Spain.

WINES.

*Report.*—Excellent dry pale Montilla wines.

## 1916. José Canela, Lucena, Cordova, Spain.

WINES.

*Report.*—Excellent dry pale Montilla wines.

## 1917. Antonio Sanchez Almodovar, Alicante, Spain.

WINES.

*Report.*—Good dry wines.

## 1918. Pedro Carretero, Cordova, Spain.

WINES.

*Report.*—Very good Montilla wines.

## 1919. Fumaña Brothers, Reus, Tarragona, Spain.

WINES.

*Report.*—Excellent red wines.

## 1920. José Amell y Carbonell, Sitjes, Barcelona, Spain.

WINES.

*Report.*—Very good Malvasia sweet wine.

## 1921. José Maria Neble, Bollullos, Huelva, Spain.

WINES.

*Report.*—Good dry pale Manzanilla wines.



**1922. Francisco Gil, Reus, Tarragona, Spain.**

WINES.

*Report.*—Commended for the good quality of his old white “Cabernet,” and also for sparkling wines.

---

**1923. Carey Brothers & Co., Tarragona, Spain.**

WINES.

*Report.*—Commended for the good quality of their red Priorate and Muscatel wines.

---

**1924. Antonio Raigon, Montilla, Cordova, Spain.**

WINES.

*Report.*—Good dry pale Montilla wines.

---

**1925. Camilo Castillo Corella, Navarra, Spain.**

WINES.

*Report.*—Very good sweet wines.

---

**1926. Nicolas Gomez Gonzales, Huelva, Spain.**

WINES.

*Report.*—Good dry pale sherry wines.

---

**1927. Agustin Vilaret, Blanes, Gerona, Spain.**

WINES.

*Report.*—Very good sparkling wines.

---

**1928. Marques de Mudela, Valdepeñas, Ciudad Real, Spain.**

WINES.

*Report.*—Excellent red and white Valdepeñas wines.

---

**1929. José Deu & Co., Masqueja, Barcelona, Spain.**

RED WINE.

*Report.*—A very good table claret, of good condition and taste.

---

**1930. Ricardo Starico y Ruiz, Ribarrojo, Valencia, Spain.**

WINES.

*Report.*—Excellent sweet Muscatel wines.

---

**1931. Francisco Calvo, Valencia, Spain.**

WINES.

*Report.*—Excellent orange-wine liquors.

---

**1932. Angel Domeneck, Valencia, Spain.**

WINES.

*Report.*—Good red wines.

## 1933. Amorís Brothers, Valencia, Spain.

## WINES.

*Report.*—Good red wines.

---

## 1934. Pedro Domecq, Jerez, Spain.

## WINES.

*Report.*—Commended for the excellent condition of his large collection of new and very old sherry wines.

---

## 1935. Antonio José Navarro, Montilla, Cordova, Spain.

## WINES.

*Report.*—Good dry pale Montilla wines.

---

## 1936. Rafael Iñiguez Pinzon, Moguer, Huelva, Spain.

## WINES.

*Report.*—Very good dry pale Manzanilla wines.

---

## 1937. Manuel Villalva y Sotomayor, Montilla, Cordova, Spain.

## WINES.

*Report.*—Good dry pale Montilla wines.

---

## 1938. Bartolomé Polo, Montilla, Cordova, Spain.

## WINES.

*Report.*—Excellent dry pale Montilla wines.

---

## 1939. Luis Hernandez Pinzon, Moguer, Huelva, Spain.

## WINES.

*Report.*—Good dry Manzanilla wines, old and new.

---

## 1940. Francisco Solano Salas, Montilla, Cordova, Spain.

## WINES.

*Report.*—Good Montilla wines, dry and sweet.

---

## 1941. Carlos Alvear, Montilla, Cordova, Spain.

## WINES.

*Report.*—Very good dry pale Montilla wines.

---

## 1942. Gimenez de Tejada Brothers, Moguer, Huelva, Spain.

## WINES.

*Report.*—Very good pale Manzanilla wines.

---

## 1943. Marques de Casa Loring, Malaga, Spain.

## WINES.

*Report.*—Commended for the excellent quality of old and late vintages of Montilla wines, and the delicacy and perfect condition of their sweet and dry Malaga wines.

## 1944. Scholtz Brothers, Malaga, Spain.

## WINES.

*Report.*—A good collection of sweet and dry Malaga wines.

---

## 1945. Marques de Cabellero, Nava del Rey, Valladolid, Spain.

## WINES.

*Report.*—Very good red sweet wines.

---

## 1946. José Gallarde y Gusman, Malaga, Spain.

## WINES.

*Report.*—Good sweet and and dry Montilla wines.

---

## 1947. Hilarion Cloramunt, Vinaroz, Valencia, Spain.

## WINE.

*Report.*—A sweet wine of peculiar and most agreeable taste, and in very good condition.

---

## 1948. José Scals, Jijona, Spain.

## WINE.

*Report.*—A dry wine, called Aloque Rancio; a very good, old, well-kept, very dry, and highly aromatic wine.

---

## 1949. Antoliano Perez Albert, Monovar, Alicante, Spain.

## WINE.

*Report.*—Good table wine, of good taste, and very cheap.

---

## 1950. L. Oliver, San Juan, Huesca, Spain.

## WINE.

*Report.*—Very good table wine, remarkable for its cheapness.

---

## 1951. Don Juan Omlin, Requena, Valencia, Spain.

## WINE.

*Report.*—Good table wine, at a very low price.

---

## 1952. Count of Cirat y Villafranqueza, Hara, Logroño, Spain.

## WINE.

*Report.*—Pretty good table wine.

---

## 1953. José Prat del Monte, Barcelona, Spain.

## WINE.

*Report.*—Good appetizing wine, closely resembling the Vermouth wine; good color and brightness.

---

## 1954. Francisco Lluch, Sagunto, Valencia, Spain.

## WINE.

*Report.*—A dry, red wine, very good for table; suitable for home consumption, and remarkably cheap.

1955. Don José Coquillat y Sempere, Elche, Alicante, Spain.

WINE.

*Report.*—A very pure, very rich and fruity old Muscatel wine.

---

1956. Jaime Iranzo, Turis, Valencia, Spain.

WINE.

*Report.*—A fine sweet white wine, in good condition, and agreeable to the taste.

---

1957. Ciro Perez Paya, Monovar, Spain.

WINE.

*Report.*—A complete selection of good and carefully made table wines.

---

1958. Joaquin Verdu y Perez, Monovar, Spain.

WINE.

*Report.*—A dry red wine of 1820; very good old wine; most beautifully kept, and highly flavored.

---

1959. Pedro J. Nager, Olerea, Valencia, Spain.

WINE.

*Report.*—A very nice white wine; very clear, and good in every respect.

---

1960. Doña Remedios Perez Verdu, Monovar, Spain.

WINE.

*Report.*—A very old dry wine, suitable for dessert.

---

1961. José Maria Pujol, Valencia, Spain.

WINE.

*Report.*—A very old, aromatic, and agreeable wine, of the style of port.

---

1962. Teodoro Creaux, Villanueva, Barcelona, Spain.

WINE.

*Report.*—A common table wine of 1874 vintage, in good condition, very cheap, and well suited for home consumption.

---

1963. Lorenzo Puig & Brother, Monunat, Valencia, Spain.

WINE.

*Report.*—A very excellent and a very cheap "Garnacha" sweet wine, of the finest quality.

---

1964. Bartolomé Calabuig, Bocaliente, Valencia, Spain.

WINE.

*Report.*—A good, strong, white wine, well prepared for exportation.

---

1965. Antonio Cali, Tarrasa, Catalonia, Spain.

WINE.

*Report.*—Wine called Rancio, from vintage of 1815, in very good condition, of fine aroma, and very agreeable to the taste.

---

## 1966. Calixto Orduña, Cascante, Navarra, Spain.

WINE.

*Report.*—A sweet wine, which we must highly recommend for its most excellent qualities of aroma, taste, condition, and cheap price.

---

## 1967. Galo de Poves y Quintano, Allaurio, Logroño, Spain.

WINE.

*Report.*—A very well prepared table wine, suitable in all its conditions and price.

---

## 1968. Serapio Artegeus, Jativa, Valencia, Spain.

WINE.

*Report.*—A very pleasant, rich, and fruity Muscatel wine, highly aromatic.

---

## 1969. Enrique Cerda, Monovar, Alicante, Spain.

WINE.

*Report.*—A very fine white wine of 1863; very good in quality and condition.

---

## 1970. Francisco Ortuno y Maestre, Salinas, Alicante, Spain.

WINE.

*Report.*—A very rich and highly flavored wine, called "Fondellon."

---

## 1971. Mariano Perez, Zaragoza, Spain.

WINE.

*Report.*—A full-bodied wine, of very good taste.

---

## 1972. Juan Esteve y Amoros, Monforte, Alicante, Spain.

WINE.

*Report.*—Wine of very good flavor; well made.

---

## 1973. Joaquin Calpena Vidal, Monovar, Alicante, Spain.

WINE.

*Report.*—Good table wine; in fine condition.

---

## 1974. Pedro Sirvent y Oliver, Reus, Tarragona, Spain.

WINE.

*Report.*—Well-flavored and highly agreeable sweet wine.

---

## 1975. Miguel Pascual, Masnou, Barcelona, Spain.

WINE.

*Report.*—White wine, in very good condition; aromatic, and of good taste.

---

## 1976. Antonio Terro, Carthagena, Spain.

WINE.

*Report.*—A highly-flavored sweet wine; kept in the best condition.

## 1977. Lorenzo Fernandez Munoz, San Juan, Alicante, Spain.

WINE.

*Report.*—A red wine; very agreeable and good for table use.

## 1978. Perez, Albert, &amp; Co., Alicante, Spain.

WINE.

*Report.*—A sweet white wine of 1870; very good, natural, light, and of an agreeable taste.

## 1979. Manuel Villar, Sagunto, Valencia, Spain.

WINE.

*Report.*—A very good old brown wine; very well preserved; of fine aroma, and agreeable to the palate.

## 1980. Francisco Gil, Reus, Tarragona, Spain.

WINE.

*Report.*—A well-flavored and highly agreeable wine.

## 1981. Dr. Lorenzo Fernandez, Alicante, Spain.

WINE.

*Report.*—A well-made table wine.

## 1982. Juan Valero, Requena, Spain.

WINE.

*Report.*—A full-bodied red wine, at a very low price.

## 1983. Eduardo Hidalgo, San Lucar, Cadiz, Spain.

WINE.

*Report.*—A finely-flavored, well-made sweet wine; an excellent old "Pedro Ximenes."

## 1984. Rafael Blanco y Alcade, Cabra, Cordova, Spain.

WINE.

*Report.*—Montilla wine, the finest, lightest, most aromatic, and agreeable to the palate.

## 1985. Palma &amp; Quesada, Aguilar, Cordova, Spain.

WINE.

*Report.*—A very pure, extraordinarily light, and most delicate Montilla wine.

## 1986. Herran &amp; Co., Jerez de la Frontera, Spain.

WINE.

*Report.*—A delicious wine called "Florina;" a highly aromatic and delicate wine, "Oloroso," in excellent condition; a collection of very good sherries.

1987. **Oliver Brothers, Barcelona, Spain.**

## WINE.

*Report.*—A wine called "Rancio Seco," of exquisite flavor, and all other good qualities.

---

1988. **Fernando Cotoner, Marques de la Cenia, Majorca, Balearic Islands.**

## WINE.

*Report.*—A dry pale wine, in very good condition as to aroma and taste, and very cheap in price.

---

1989. **Juan Bautista Pina Benito, Monforte, Alicante, Spain.**

## WINE.

*Report.*—White sweet wine, very delicate, and superior in aroma.

---

1990. **Diego Linares, San Lucar, Cadiz, Spain.**

## WINE.

*Report.*—Very pure and fine Amontillado sherry, in the best condition.

---

1991. **Alejandro Laguna, Granen, Huesca, Arragon, Spain.**

## WINE.

*Report.*—Wine called Clarette, in very good condition, full-bodied, and cheap; also good and well-flavored Muscatel.

---

1992. **Juan Fornell, Alella, Barcelona, Spain.**

## WINE.

*Report.*—A nice sweet wine, and in very good order of taste and flavor.

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1993. **Bartolomé Espotorno, Murcia, Spain.**

## WINE.

*Report.*—A dry white wine, strongly flavored, well matured, and very well prepared for exportation.

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1994. **Bartolomé Roca, Palma, Island of Majorca.**

## WINE.

*Report.*—A good dry wine, highly flavored, and well prepared for exportation.

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1995. **Ramon Anguera, Falsete, Tarragona, Spain.**

## WINE.

*Report.*—A rich, full-flavored wine, made of grape called "Palomino," peculiar to the province.

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1996. **Domingo Ventallo y Llobateras, Tarrasa, Barcelona, Spain.**

## WINE.

*Report.*—A well-fermented dry wine, well kept, and in good condition.

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1997. **Romany & Sons, Denia, Alicante, Spain.**

## WINE.

*Report.*—A collection of very good wines for exportation, remarkably cheap, considering the quality.

## 1998. E. Menchero, Carthagena, Spain.

WINE.

*Report.*—Orange wine of very fine fruity taste, and very dry.

## 1999. Ramon Samora, Poboleda, Tarragona, Spain.

WINE.

*Report.*—Wine called "Garnacha," in very good condition, full flavored, and of a very good taste.

This wine deserves especial mention as regards the class of "Garnacha" wine.

## 2000. Ezequiel de la Vega, Guadalajara, Spain.

WINE.

*Report.*—A good cheap white wine, in a very good condition of aroma and taste.

## 2001. Gabriel Barrera, Tayá, Barcelona, Spain.

WINES.

*Report.*—Good sweet red wines.

## 2002. Federico Segundo, Puerto de Santa Maria, Cadiz, Spain.

WINES.

*Report.*—Very good dry and sweet sherry wines.

## 2003. E. &amp; B. Olivencia Brothers, Olivares, Seville, Spain.

WINE.

*Report.*—Very good sweet wines.

## 2004. Ramon Carli, Puerto de Santa Maria, Cadiz, Spain.

WINES.

*Report.*—Good sweet and Malvasia wines.

## 2005. Bocardi &amp; Co., Santiago de Cuba, Cuba.

WINE.

*Report.*—A good and fine orange wine, called "Vino de Naranja;" very well prepared.

## 2006. Guillermo Davison &amp; Co., La Orotava, Canary Islands.

WINES.

*Report.*—Excellent sweet wines.

## 2007. Bruce Hamilton &amp; Co., La Orotava, Canary Islands.

WINE.

*Report.*—A good collection of well-prepared wines; dry and sweet.

## 2008. Jose Maria da Fonseca, Setubal, Portugal.

COGNAC MUSCATTEL, 1875.

*Report.*—Very fine flavor; made from the Muscatel grape; well distilled, and very pure.



2009. Boaventura da Piedade Figueira, Cuba, Beja, Portugal.

WINE.

*Report.*—Highly rich in taste; very good in composition.

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2010. Dr. Joaquim Paes d'Abranches, Taboa, Coimbra, Portugal.

WINE.

*Report.*—Highly rich in taste; of very good composition.

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2011. Manuel d'Aquino Alves do Conto, Villa Real, Portugal.

WINE.

*Report.*—Geropiga wine; very rich in taste, and very good in composition.

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2012. Luiz da Silva Athayde Costa, Leiria, Portugal.

WINES.

*Report.*—A collection of wines; highly rich in taste; of very good composition.

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2013. João de Sousa Falcão, Almeirim, Santarem, Portugal.

WINE.

*Report.*—White wine, "Geropiga, 1875;" highly rich in taste; of very good composition.

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2014. Administration of the Concelho of Poiares, Coimbra, Portugal.

WINE.

*Report.*—Highly rich in taste; of very good composition.

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2015. Joaquim Maria do Amaral Cardozo, Anadia, Aveiro, Portugal.

WINES.

*Report.*—Highly rich in taste; of very good composition.

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2016. Manuel Coelho da Fonseca, Oliveira do Hospital, Coimbra, Portugal.

WINE.

*Report.*—Highly rich in taste; of very good composition.

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2017. Jose Augusto dos Santos Fora, Figueira, Coimbra, Portugal.

WINES.

*Report.*—A collection of wines; highly rich in taste; of very good composition.

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2018. Domingo Antonio de Freitas, Ameias, Coimbra, Portugal.

WINE.

*Report.*—Highly rich in taste; of very good composition.

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2019. Luiz Antonio Fragozo, Jr., Ferreira, Beja, Portugal.

WINES.

*Report.*—A collection of wines; highly rich in taste; of very good composition.

2020. Joaquim Jeronymo Pereira, Peral, Cadaval, Lisbon, Portugal.

WINES.

*Report.*—Of very superior quality; remarkable for their taste and composition.

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2021. Jose Lopes Guimarães, Coimbra, Portugal.

WINE.

*Report.*—A collection of wines; highly rich in taste; of very good composition.

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2022. Joaquim Nunes Vieira Rapozo, Coruche, Santarem, Portugal.

WINES.

*Report.*—Of superior quality; remarkable for their taste and composition.

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2023. Widow of João Martins Formosinho, Lagoa, Faro, Portugal.

WINE.

*Report.*—Red wine, Bouvedro, 1874; highly rich in taste; of very good composition.

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2024. Jose Maria da Silveira e Menezes, Borba, Portugal.

WINES.

*Report.*—Highly rich in flavor; of very good composition.

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2025. Miguel Salvado Rosado Perdigo, Evora, Portugal.

WINES.

*Report.*—Of superior quality; remarkable for their taste and composition.

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2026. Arthur Peres de Vilhena Barboza, Cartaxo, Santarem, Portugal.

WINE.

*Report.*—Of superior quality; remarkable for its taste and composition.

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2027. Francisco Cancellia, Anadia, Aveiro, Portugal.

WINES.

*Report.*—Highly rich in flavor; of very good composition.

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2028. Alexandre Jose Malheiro Madeira, Candedo, Murça, Portugal.

WINE.

*Report.*—Highly rich in taste; of very good composition.

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2029. Maria Rita Ramos Borges Pinto, Folgosa, Armamar, Portugal.

WINES.

*Report.*—Of superior quality; remarkable for their taste and composition.

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2030. Antonio Rodrigues Pereira, Peniche, Leiria, Portugal.

WINES.

*Report.*—A collection of wines; highly rich in taste; of very good composition.

## 2031. Antonio Joaquim Pinheiro, Penamacor, Castello Branco, Portugal.

WINES.

*Report.*—Of superior quality; remarkable for their taste and composition.

## 2032. Antonio dos Santos, Vizeu, Portugal.

WINE.

*Report.*—Very good table wine; delicate, fruity flavor, and very well kept.

## 2033. Antonio Pedro Cardozo Morte-Certa, Alcacer do Sal, Lisbon, Portugal.

WINES.

*Report.*—White wines; very delicate and rich.

## 2034. João da Rosa Malheiro Mello, Candedo, Murça, Portugal.

WINES.

*Report.*—Very rich; in very good condition.

## 2035. Antonio Augusto Lobo de Miranda, Lagos, Faro, Portugal.

WINES.

*Report.*—A collection of wines; highly rich in taste; of very good composition.

## 2036. Jose Alves de Moraes, Vinhaes, Bragança, Portugal.

WINE.

*Report.*—Very good table wine; delicate, fruity flavor, and perfectly well kept.

## 2037. Jose de Barros e Cunha, Torres Vedras, Lisbon, Portugal.

WINE.

*Report.*—A remarkable red wine, "Trincadeira;" very genuine and light; a very superior table wine.

## 2038. Moraes &amp; Mouro, Figueira, Coimbra, Portugal.

WINES.

*Report.*—Very rich in taste; in very good condition.

## 2039. Dr. Alfredo de Moura Mattoso, Soure, Coimbra, Portugal.

WINE.

*Report.*—Wine "Geropiga;" highly rich in taste; of very good composition.

## 2040. Jose de Castro, Bragança, Portugal.

WINES.

*Report.*—Muscatel and Bastardo wines; in very good condition.

## 2041. Joaquim Lobo de Miranda, Lagos, Faro, Portugal.

WINES.

*Report.*—A collection of wines; highly rich in taste; of very good composition.

**2042. Simão Ribas, Guarda, Portugal.**

WINE.

*Report.*—Of superior quality; remarkable for its taste and composition.**2043. Antonio de Villafanha, Tondella, Vizeu, Portugal.**

WINES.

*Report.*—Of very superior quality.**2044. Domingos Antonio da Costa, Elvas, Portalegre, Portugal.**

WINE.

*Report.*—Red wine, 1875; highly rich in taste; of very good composition.**2045. João Joaquim Bagulho, Villa Boim, Elvas, Portalegre, Portugal.**

WINES.

*Report.*—Highly rich in taste; of very good composition.**2046. Antonio Pires da Silva, Villa Franca de Xira, Lisbon, Portugal.**

WINES.

*Report.*—A collection of very good table wines; delicate, of fruity flavor, and perfectly well kept.**2047. Vicente Xavier Magalhães, Tavira, Faro, Portugal.**

WINE.

*Report.*—Highly rich in taste; of very good composition.**2048. Maria Emilia d'Almeida Morão, Castello Branco, Penamacor, Portugal.**

WINES.

*Report.*—Very delicate; of remarkable flavor.**2049. Pedro d'Albuquerque Silva Amaral, Mangualde, Vizeu, Portugal.**

WINES.

*Report.*—A collection of very good table wines; delicate, fruity flavor, and very well kept.**2050. Antonio Theodoro Ferreira Tabordo, Penamacor, Castello Branco, Portugal.**

WINE.

*Report.*—Wine of superior quality; remarkable for its taste and composition.**2051. Bento Antonio Trigo de Negreiros, Mirandella, Bragança, Portugal.**

WINES.

*Report.*—Highly rich in taste; of very good composition.**2052. Pedro de Souza Garcia, Estremoz, Evora, Portugal.**

WINES.

*Report.*—Red wines; very rich.

**2053. Joaquim Antonio Simoes, Figueira, Coimbra, Portugal.**

## WINES.

*Report.*—A remarkable collection of thirty different qualities of wines (red and white); very rich.

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**2054. Antonio de Freitas Campos, Anadia, Aveiro, Portugal.**

## WINE.

*Report.*—Very rich in taste; of very good composition.

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**2055. Fortunato Viera das Neves, Taboa, Coimbra, Portugal.**

## WINE.

*Report.*—Highly rich in taste; of very good composition.

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**2056. Paulo Jorge, Oeiras, Lisbon, Portugal.**

## WINES.

*Report.*—Remarkable Carcavellos wines, 1873 and 1874; taste extraordinarily rich.

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**2057. Costa Pereira & Son, Figueira, Coimbra, Portugal.**

## WINES.

*Report.*—Red and white wines, very rich in taste; Geropiga very delicate.

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**2058. Antonio Ferreira Sarmento, Vinhaes, Bragança, Portugal.**

## WINES.

*Report.*—Very good table wine; delicate, fruity flavor, and perfectly well kept.

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**2059. Antonio da Silva Mesquita, Cartaxo, Santarem, Portugal.**

## WINES.

*Report.*—A collection of wines, highly rich in taste; of very good composition.

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**2060. Pedro Xavier Machado, Portalegre, Portugal.**

## WINES.

*Report.*—Highly rich in taste; of very good composition.

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**2061. Antonio Camillo da Silva Lopes, Coruche, Santarem, Portugal.**

## WINES.

*Report.*—Very delicate, and of remarkable flavor.

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**2062. Luis Antonio de Magalhães, Fundão, Castello Branco, Portugal.**

## WINES.

*Report.*—A collection of wines, highly rich in taste; of very good composition.

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**2063. Manuel Lourenço d'Almeida, Gervide, Pezo da Regoa, Portugal.**

## WINE.

*Report.*—Very good "Muscatel wine;" of remarkable flavor and taste, and perfect composition.

2064. Antonio Felgueiras da Silva Moita, Torres Novas, Santarem, Portugal.

WINES.

*Report.*—Very rich in taste; of very good composition.

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2065. Jose Francisco Rodriguez do Passo, Fuzeta, Tavira, Faro, Portugal.

WINES.

*Report.*—Very rich in taste, and in a very good condition.

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2066. Borges de Souza, Azambuja, Lisbon, Portugal.

WINE.

*Report.*—White wine, 1874, of very good composition and taste; a very delicate wine.

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2067. Manuel Rodriguez de Azevedo, Bucellas, Lisbon, Portugal.

WINE.

*Report.*—White wine, "Bucellas," of a delicate taste and flavor, remarkably agreeable and distinct.

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2068. Jose Gomes da Silva, Collares, Lisbon, Portugal.

WINES.

*Report.*—Table wines of very good quality, superior taste and flavor (bouquet). Tasted in July, and found perfectly well kept.

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2069. Joaquim de Carvalho Azevedo Mello é Faro, Rezende, Vizeu, Portugal.

WINES.

*Report.*—Very good table wines; delicate, fruity flavor, and perfectly well kept.

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2070. Jose da Cunha Pignatelly, Trinta, Guarda, Portugal.

WINE.

*Report.*—Red wine of 1874, of superior quality; remarkable for its taste and composition.

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2071. Nicolau Joaquim de Salles, Lobo, Evora, Portugal.

WINE.

*Report.*—Highly rich in taste; very good in composition.

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2072. Baron of Mogadouro, Pinhel, Guarda, Portugal.

WINES.

*Report.*—A collection of wines of superior quality; remarkable for their taste and composition.

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2073. Jose Maria Dantas Pimienta, Torres Novas, Santarem, Portugal.

WINES.

*Report.*—Very superior wines from Torres Novas; remarkable for their flavor and taste.

2074. Elisa Ludovina da Silva Mello, Covilha, Castello Branco, Portugal.

WINES.

*Report.*—Very rich in taste; of very good composition.

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2075. Jose de Mello, Thomar, Santarem, Portugal.

WINES.

*Report.*—Highly rich in taste; of very good composition.

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2076. Antonio Marcellino Carrilho Bello, Castello de Vide, Portalegre, Portugal.

WINES.

*Report.*—Highly rich in taste; of very good composition.

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2077. Francisco Xavier de Moraes Pinto, Mirandella, Bragança, Portugal.

WINE.

*Report.*—Red wine, 1870, of superior quality; remarkable for its taste and composition.

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2078. João Baptista Ribeiro Guisado, Peniche, Leiria, Portugal.

WINE.

*Report.*—Very rich in taste; very good composition.

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2079. Catharina Mousinho Almadamino Vasconcellos, Niza, Portalegre, Portugal.

WINE.

*Report.*—Highly rich in taste; very good composition.

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2080. Agostinho Cancellia, Anadia, Aveiro, Portugal.

WINES.

*Report.*—Highly rich in flavor; of very good composition.

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2081. Jose Rodriguez Tocha, Estremoz, Evora, Portugal.

WINES.

*Report.*—A collection of wines very rich in taste, of very good composition.

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2082. Alexandre de Seabra, Anadia, Aveiro, Portugal.

WINES.

*Report.*—A collection of wines highly rich in flavor, of very good composition.

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2083. Pedro d'Ordaz, Caldeira de Valladares, Castello Branco, Portugal.

WINE.

*Report.*—Highly rich in taste; of very good composition.

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2084. Viscount of Serrado, Vizeu, Portugal.

WINES.

*Report.*—Very good table wines; delicate, fruity flavor; perfectly well kept.

**2085. Manuel Duarte Laranja, Coruche, Santarem, Portugal.**

WINES.

*Report.*—Wines very delicate; of remarkable flavor.**2086. Miguel Castro Martins, Ponte de Sor, Portalegre, Portugal.**

WINES.

*Report.*—Highly rich in taste; of very good composition.**2087. Cossart, Gordon, & Co., Funchal, Island of Madeira.**

WINES.

*Report.*—A remarkable collection of very fine Madeira wines,—very good,—Verdellin, Bool. and Malmsey.**2088. J. F. Figueira, Funchal, Island of Madeira.**

WINE.

*Report.*—Very good wine of Verdellin; superior delicacy in taste.**2089. Silva & Cossens, Villa Nova, Oporto, Portugal.**

WINES.

*Report.*—A remarkable collection of superior port wines; samples of very good 1830 and 1834.**2090. Jose Dominguez Contada, Barcellos, Braga, Portugal.**

WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.**2091. Jose Baptista Duarte, Castello de Vide, Portalegre, Portugal.**

WINE.

*Report.*—Highly rich in taste; of very good composition.**2092. Honorio Fiel Lima, Portalegre, Portugal.**

WINE.

*Report.*—Highly rich in taste; of very good composition.**2093. Fernando dos Santos Gallope, Portalegre, Portugal.**

WINE.

*Report.*—Red wine 1875, highly rich in taste; of very good composition.**2094. Cresswell & Co., Moita, Lisbon, Portugal.**

WINES.

*Report.*—A collection of wines very rich in taste; of very good composition.



2095. Jorge Abraham d'Almeida Lima, Seixal, Lisbon, Portugal.

WINES.

*Report.*—Highly rich in taste; of very good composition.

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2096. Antonio Perfeito Pereira Pinto Ozorio, Lamego, Vizeu, Portugal.

WINES.

*Report.*—Highly rich in taste; of very good composition.

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2097. Jose da Graca Pereira Roza, Niza, Portalegre, Portugal.

WINE.

*Report.*—Highly rich in taste; of very good composition.

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2098. Benito Mattheus Martins, Elvas, Portalegre, Portugal.

WINES.

*Report.*—Highly rich in taste, especially that of 1873; of very good composition.

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2099. Jose Gonçalves da Silva, Portalegre, Portugal.

WINE.

*Report.*—Highly rich in taste; of very good composition.

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2100. João Antonio Marquez Rosado, Redondo, Evora, Portugal.

WINES.

*Report.*—Of superior quality; remarkable for their taste and composition.

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2101. Hunt, Roope, Teage, & Co., Oporto, Portugal.

WINES.

*Report.*—A collection of very good port wines. A sample of the celebrated port wine, 1815.

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2102. Francisco Severianno Carrilho Bello, Castello de Vide, Portalegre, Portugal.

WINES.

*Report.*—Highly rich in taste; of very good composition.

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2103. Ricardo Jose Caldeira, Alegrete, Portalegre, Portugal.

WINE.

*Report.*—Highly rich in taste; of very good composition.

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2104. Bartholomeu Corinho, Montargil, Portalegre, Portugal.

WINES.

*Report.*—Highly rich in taste; of very good composition.

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2105. Joaquim Guilherme de Vasconcellos, Elvas, Portalegre, Portugal.

WINES.

*Report.*—Highly rich in taste; very good in composition.

2106. Manoel Telles da Gama, Villa Franca, Lisbon, Portugal.

WINE.

*Report.*—Red wine; light, remarkable for its composition; a good table wine.

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2107. Jose Maria Casqueiro, Crato, Portalegre, Portugal.

WINE.

*Report.*—Highly rich in taste; of very good composition.

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2108. Antonio Luiz de Macedo, Lisbon, Portugal.

WINES.

*Report.*—Highly rich in taste; of very good composition.

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2109. Commercial Bairrada Wine Co., Vaccarica, Aveiro, Portugal.

WINES.

*Report.*—Very rich and perfectly well composed. The white wines are remarkable.

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2110. Francisco Albuquerque Mello Pereira e Caceres, Oporto, Portugal.

WINES.

*Report.*—Very rich.

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2111. Jeronymo Bivar, Faro, Portugal.

WINES.

*Report.*—Very rich; very good condition.

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2112. João Pedro Martins, Setubal, Lisbon, Portugal.

WINES.

*Report.*—Highly rich in taste; of very good composition.

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2113. Honorato Jose Torres Machado, Azambuja, Lisbon, Portugal.

WINES.

*Report.*—Highly rich in taste; of very good composition.

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2114. Miguel Ozorio Cabral e Castro, Coimbra, Portugal.

WINES.

*Report.*—Very rich; very good condition.

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2115. D. Joaquina Ferrão, Castello Branco, Lisbon, Portugal.

WINES.

*Report.*—Very delicate; remarkable flavor.

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2116. Anacleto da Fonseca Motta, Sardoal, Santarem, Portugal.

WINES.

*Report.*—Highly rich in taste; of very good composition.

**2117. Joaquim d'Almeida Negrão, Portimão, Faro, Portugal.**

WINES.

*Report.*—Very rich in taste, and in a very good condition.**2118. Francisco d'Abreu Fialho, Portimão, Faro, Portugal.**

WINES.

*Report.*—Very rich; in very good condition.**2119. Manuel João Lopes, Tavira, Faro, Portugal.**

WINES.

*Report.*—Very rich; in very good condition.**2120. Ysidoro Martins, Borba, Evora, Portugal.**

WINES.

*Report.*—Highly rich in taste; of very good composition.**2121. Jose Joaquim Moreno, Avargas, Lisbon, Portugal.**

WINES.

*Report.*—Very rich in taste, and in a very good condition.**2122. Joaquim Pereira, Cadoval, Lisbon, Portugal.**

WINE.

*Report.*—Very rich in taste, and in very good condition.**2123. Antonio Nunes de Souza & Sons, Covilhan, Portugal.**

WINE.

*Report.*—Wine of superior quality; remarkable by its taste and composition.**2124. Antonio Bernardo Xavier Tavares, Portalegre, Portugal.**

WINES.

*Report.*—Highly rich in taste; of very good composition.**2125. Antonio Augusto da Costa Simoes, Vaccarica, Aveiro, Portugal.**

WINES.

*Report.*—Very delicate; of remarkable flavor.**2126. Luiz da Costa Falcão, Constanca, Santarem, Portugal.**

WINES.

*Report.*—Very delicate; of remarkable flavor.**2127. Viscount of the Outeiro, Castello Branco, Portugal.**

WINES.

*Report.*—Red wines of a very superior quality; that of 1852 remarkably good.

**2128. Jeronymo Augusto Pacheco Pereira Lite, Caves, Braga, Portugal.**

WINE.

*Report.*—Very good table wine; light, and of very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2129. Jose da Cunha Sampaio, Braga, Portugal.**

WINE.

*Report.*—Very good table wine; light, and of very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2130. Antonio Bernardo da Fonseca Moniz, Baracal, Guarda, Portugal.**

WINES.

*Report.*—Highly rich in taste; of very good composition.

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**2131. Jose Eloy das Neves, Peral, Lisbon, Portugal.**

WINES.

*Report.*—A collection of wines highly rich in taste; of very good composition.

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**2132. Leonor de Carvalho Fonseca Amaral, Mangualde, Vizeu, Portugal.**

WINE.

*Report.*—Very good table wine; delicate, fruity flavor, and very well kept.

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**2133. Vasco Bernardes, Coruche, Santarem, Portugal.**

WINE.

*Report.*—Very good table wine; delicate, fruity flavor, and perfectly well kept.

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**2134. Venancio Dias de Figueiredo Vieira, Eixo, Aveiro, Portugal.**

WINE.

*Report.*—Very good table wine; delicate, fruity flavor, and very well kept.

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**2135. Jose Carlos Zuzarte, Parada, Vizeu, Portugal.**

WINES.

*Report.*—Very delicate, and of remarkable flavor.

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**2136. Francisco Thiago de Magalhães, Taboa, Coimbra, Portugal.**

WINE.

*Report.*—Highly rich in taste; of very good composition.

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**2137. Manuel Goncalves de Figueiredo, Aveiro, Portugal.**

WINES.

*Report.*—Highly rich in taste; of very good composition.

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**2138. Carlos da Costa Pereira Mendes, Thomar, Santarem, Portugal.**

WINE.

*Report.*—Wine, "Geropiga;" highly rich in taste; of very good composition.

**2139. Romão Antunes Trincão, Torres Novas, Santarem, Portugal.****WINES.**

*Report.*—Highly rich in taste; of very good composition.

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**2140. Antonio Adelaide Ferreira, Godim, Villa Real, Portugal.****PORT WINES.**

*Report.*—An excellent collection of port wines from 1815 to 1874. The celebrated wines of 1847, 1834, 1820, and 1815 may be said to be perfect, especially the "Malmseys" of 1815, which have a very delicious, rich flavor.

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**2141. Antonio Carlos Moreira, Penafiel, Oporto, Portugal.****WINES.**

*Report.*—Very good table wine; light, and of very nice taste and flavor (bouquet); of very good composition; tasted in July, and found perfectly well kept.

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**2142. Viscount of Vilarinho de S. Romão, Oporto, Portugal.****PORT WINES.**

*Report.*—Port wines of very superior quality; the Malmsey dry and very rich.

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**2143. Rebello Valente Allen, Oporto, Portugal.****PORT WINES.**

*Report.*—A remarkable collection of port wines from 1827 to 1873. Among the most precious are those of 1827 and 1830, extraordinarily rich in taste and flavor.

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**2144. Agricultural Society of Oporto, Oporto, Portugal.****PORT WINES.**

*Report.*—A standard collection of port wines of the vintages from 1760 to 1860. These wines are of the best of this class. Those of 1820, 1815, 1810, and 1760 are unexcelled as to richness of flavor. That of 1820 was brought back from India; and the 1760 is very remarkable for its delicacy and richness after one hundred and sixteen years. It was made four years after the foundation of the celebrated Royal Wine Company of Oporto.

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**2145. Welsh Brothers, Funchal, Island of Madeira.****MADEIRA WINES.**

*Report.*—Very good Madeira wines. The "Boal," 1840, is remarkably good. All the collection very rich in flavor and taste.

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**2146. Antonio Nicolau d'Almeida, Jr., & Brother, Oporto, Portugal.****PORT WINES.**

*Report.*—A very good collection of port wines, highly rich in flavor.

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**2147. Viscount of Guedes, Evora, Portugal.****WINE.**

*Report.*—Very rich in taste, and kept in very good condition.

**2148. Henrique Caldeira Pedrozo, Castello Branco, Portugal.**

WINE.

*Report.*—Wine of superior quality; remarkable by its taste and composition.**2149. Offey, Cramp, & Forresters, Oporto, Portugal.**

PORT WINES.

*Report.*—A remarkable collection of port wines; flavor and taste rich, especially the red wine, V. R.**2150. Sandemann & Co., Villa Nova de Gaia, Oporto, Portugal.**

PORT WINES.

*Report.*—A very good collection of port wines; taste considerably rich.**2151. Viscount of the Gandarinha, Lisbon, Portugal.**

WINE.

*Report.*—Remarkable in taste and flavor; of very good composition.**2152. Augusto de Moura, Celorico de Basto, Portugal.**

WINE.

*Report.*—Very good table wine; light, and of very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.**2153. Joaquim Soares Monteiro, Oporto, Portugal.**

WINE.

*Report.*—Very good table wine; light, and of very nice flavor (bouquet), and of very good composition. Tasted in July, and found perfectly well kept.**2154. Honorato Jose Machado d'Abreu, Torres Vedras, Lisbon, Portugal.**

WINE.

*Report.*—Highly rich in taste; of very good composition.**2155. Henrique de Sa Nogueira, Portalegre, Portugal.**

WINE.

*Report.*—Highly rich in taste; of very good composition.**2156. Simão P. Velho Moscozo, Vianna do Castello, Portugal.**

WINES.

*Report.*—Very good table wines; light, and of very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.**2157. Jose Ramos Lopes, Airó, Braga, Portugal.**

WINE.

*Report.*—Very good table wine; light, and of very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

**2158. Manuel Alves Machado, Celorico de Basto, Braga, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and of very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2159. Antonio da Silva Lisboa, Penafiel, Oporto, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and of very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2160. Bernardino Vaz Lobo, Celorico de Basto, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and of very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2161. Viscount of Prime, Vizeu, Portugal.**

## WINES.

*Report.*—Red wines of very superior qualities.

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**2162. Antonio Pinheiro Ramalho, Reguengos, Evora, Portugal.**

## WINES.

*Report.*—Very rich; in very good condition.

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**2163. Baron of Granjão, Mesão Frio, Villa Real, Portugal.**

## WINES.

*Report.*—Very rich; in very good condition.

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**2164. Antonio José Ramalho, Reguengos, Evora, Portugal.**

## WINES.

*Report.*—Very rich; in very good condition.

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**2165. Simão Paes de Faria, Lisbon, Portugal.**

## WINES.

*Report.*—Very rich; in very good condition.

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**2166. Domingos Antonio Fallé Ramalho, Redondo, Evora, Portugal.**

## WINES.

*Report.*—Very rich; in very good condition.

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**2167. Widow A. J. Judice, Lagoa, Faro, Portugal.**

## WINES.

*Report.*—Very rich; in very good condition.

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**2168. Eduardo Augusto da Cruz Vaz, Castello Branco, Portugal.**

## WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.

**2169. Manuel Duarte da Silva Caldas, Cartaxo, Santarem, Portugal.**

WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.**2170. Francisco Jose Souza, Alemquer, Lisbon, Portugal.**

WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.**2171. Francisco Quintanilha, Cuba, Beja, Portugal.**

WINE.

*Report.*—Highly rich in taste; very good in composition.**2172. Augusto Ferreira Brandão, Vaccarica, Mealhada, Aveiro, Portugal.**

WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.**2173. Antonio Barbas da Torre, Covilha, Castello Branco, Portugal.**

WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.**2174. Joaquim Manuel Theotonio, Sr., Serpa, Beja, Portugal.**

WINE.

*Report.*—Highly rich in taste; very good in composition.**2175. Jose Candido de Castro Souza, Beja, Portugal.**

WINE.

*Report.*—Highly rich in taste; very good in composition.**2176. Ernesto de Mendonca e Silva, Abrigada, Alemquer, Lisbon, Portugal.**

WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.**2177. Bernardo de Lemos Teixeira de Aguiar, Lisbon, Portugal.**

WINES.

*Report.*—Very remarkable port wines; highly rich.**2178. Antonio d'Almeida Pereira, S. Pedro de Franco, Vizeu, Portugal.**

WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.**2179. Luiz da Silva Coutinho, Cascaes, Lisbon, Portugal.**

WINES.

*Report.*—Very good "Carcavellos" wines; very rich in flavor and taste.



2180. Joaquim Claudino de Moraes, Regoa, Villa Real, Portugal.

WINES.

*Report.*—Very good port wines; remarkable in taste.

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2181. Joaquim Augusto de Macedo, Thomar, Santarem, Portugal.

WINES.

*Report.*—A remarkable collection of red and white wines, and of "Geropigas;" very rich.

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2182. Luiz Clemente de Sequeira, Vizeu, Portugal.

WINES.

*Report.*—Very good port wines; that of 1844 very superior.

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2183. Francisco Candido da Silva, Torres Novas, Santarem, Portugal.

WINE.

*Report.*—Wine, "Geropiga, 1874," of superior quality; remarkable by its taste and composition.

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2184. Antonio da Cunha d'Azevedo Lemos, S. João da Pesqueira, Vizeu, Portugal.

WINE.

*Report.*—Highly rich in taste; very good in composition.

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2185. Antonio Marques de Carvalho, Chamusca, Santarem, Portugal.

WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.

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2186. Jose Velozo Pinto de Carvalho, Lamego, Vizeu, Portugal.

WINE.

*Report.*—Very remarkable Malmsey wine of 1872; very rich port wine.

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2187. Francisco Teixeira Lobo, Sabroza, Villa Real, Portugal.

WINE.

*Report.*—Highly rich in taste; very good in composition.

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2188. Bernardo Xavier Freire, Guarda, Portugal.

WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.

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2189. João Maria da Costa, Villa Franca, Lisbon, Portugal.

WINES.

*Report.*—Of superior quality; specially the "Geropiga, 1873," remarkable by their taste and composition.

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2190. Julio Cezar de Souza, Villa Real, Portugal.

WINES.

*Report.*—Very remarkable port wines.

## 2191. Lucas da Silva Cardozo Castello, Olivaes, Lisbon, Portugal.

## WINE.

*Report.*—Very good white wine of 1874; rich in taste, very remarkable in composition.

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## 2192. Antonio Francisco Gomes, Alemquer, Lisbon, Portugal.

## WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.

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## 2193. Raphael Rodrigues d'Oliveira, Torres Novas, Santarem, Portugal.

## WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.

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## 2194. Joaquim Guilherme Cunha, Castello Branco, Portugal.

## WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.

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## 2195. Thomas Jose Machado, Bucellos, Lisbon, Portugal.

## WINES.

*Report.*—Remarkable collection of "Bucellos" wines from 1874 back to 1851; extraordinarily delicate in taste; peculiar and very good flavor.

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## 2196. Fortunato de Cerqueira Themes, Lamego, Vizeu, Portugal.

## WINE.

*Report.*—Very superior wine of 1875; rich in taste and composition.

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## 2197. João Joaquim Ramos, Redondo, Evora, Portugal.

## WINES.

*Report.*—Highly rich in taste; very good in composition.

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## 2198. Augusto Pereira Bretes, Torres Novas, Santarem, Portugal.

## WINES.

*Report.*—A collection of wines of superior quality; remarkable for their taste and composition.

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## 2199. João Antonio Nunes Reixa, Villa Vicosa, Evora, Portugal.

## WINE.

*Report.*—Highly rich in taste; very good in composition.

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## 2200. Manuel Pinto Lello, Fontes, Villa Real, Portugal.

## WINE.

*Report.*—Highly rich in taste; very good in composition.

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## 2201. Prego &amp; Franco, Redondo, Evora, Portugal.

## WINES.

*Report.*—Highly rich in taste; very good in composition.

**2202. Gregorio da Cunha, Alemquer, Lisbon, Portugal.****WINES.**

*Report.*—A collection of wines of superior quality; remarkable for their taste and composition.

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**2203. Joaquim Ignacio Ferreira, Arruda, Lisbon, Portugal.****WINES.**

*Report.*—Of superior quality; remarkable for their taste and composition.

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**2204. Agostinho Nunes d'Oliveira Costa, Villa Franca de Hira, Lisbon, Portugal.****WINES.**

*Report.*—Of superior quality; remarkable for their taste and composition.

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**2205. Bernardo Antonio da Silva Andrade, Lafoes, Vizeu, Portugal.****WINE.**

*Report.*—Very good table wine; a light and natural wine. Tasted in July, and found very well kept.

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**2206. Francisco Ferreira Campos, Santarem, Portugal.****WINE.**

*Report.*—Of superior quality; remarkable for its taste and composition.

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**2207. Luiz Teixeira Mourão, Villa Real, Portugal.****WINES.**

*Report.*—Very remarkable port wines; very rich in taste and flavor.

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**2208. Alexandre Maria de Lemos, Lamego, Vizeu, Portugal.****WINE.**

*Report.*—Highly rich in taste; very good in composition.

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**2209. Antonio da Costa Botelho, Santarem, Portugal.****WINES.**

*Report.*—Of superior quality; remarkable for their taste and composition

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**2210. Jose dos Prazeres Batalhos, Cartaxo, Santarem, Portugal.****WINE.**

*Report.*—Of superior quality; remarkable for its taste and composition.

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**2211. Francisco Maximino Borge, Villa Nova de Ourem, Santarem, Portugal.****WINE.**

*Report.*—A collection of wines of superior quality; remarkable for their taste and composition.

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**2212. Agostinho Thomaz dos Santos Viegas, Cea, Guarda, Portugal.****WINES.**

*Report.*—Of superior quality; remarkable for their taste and composition.

2213. Luiz Francisco da Silva Magalhaes, Sabroza, Villa Real, Portugal.

WINE.

*Report.*—Highly rich in taste; very good in composition.

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2214. Domingos Jose Roballo, Castello Branco, Portugal

WINE.

*Report.*—Of superior quality; remarkable for its taste and composition.

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2215. Manuel Gualdino Gameiro Cardozo, Torres Novas, Santarem, Portugal.

WINES.

*Report.*—Of superior quality; remarkable for their taste and composition.

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2216. João da Maia Rosa, Rio Maior, Santarem, Portugal.

WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.

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2217. Antonio Vieira da Rocha, Celorico, Guarda, Portugal.

WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.

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2218. Balthazar Cordes, Alemquer, Lisbon, Portugal.

WINES.

*Report.*—A collection of wines highly rich in taste; very good in composition.

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2219. Jose Felix d'Almeida Carvalho, Torres Vedras, Lisbon, Portugal.

WINE.

*Report.*—White wine; of remarkable and delicate flavor; perfect composition.

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2220. Julio Cezar Ferreira Duarte, Anadia, Aveiro, Portugal.

WINES.

*Report.*—Highly rich in taste; very good in composition.

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2221. Administration of the Concelho of Louzada, Louzada, Oporto, Portugal.

WINES.

*Report.*—Highly rich in taste; very good in composition.

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2222. Jose Maria de la Faria, Serpa, Beja, Portugal.

WINES.

*Report.*—Highly rich in taste; very good in composition.

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2223. Jacintho Maria Fialho & Son, Ferreira, Beja, Portugal.

WINES.

*Report.*—A collection of wines highly rich in taste; very good in composition.

## 2224. Anselmo Guilherme Borges Feijo, Regoa, Villa Real, Portugal.

WINES.

*Report.*—Highly rich in taste; very good in composition.

## 2225. Adriano Baptista Ferreira, Mealhada, Aveiro, Portugal.

WINE.

*Report.*—Highly rich in taste; very good in composition.

## 2226. Jose Joaquim Pinto da Costa, Nogueira, Villa Real, Portugal.

WINE.

*Report.*—Highly rich in taste; very good in composition.

## 2227. Jose Dias da Silva Calasans, Gavião, Portalegre, Portugal.

WINES.

*Report.*—Highly rich in taste; very good in composition.

## 2228. Jose Correa de Barros, Sabroza, Villa Real, Portugal.

WINE.

*Report.*—Highly rich in taste; very good in composition.

## 2229. Antonio Soares Carneiro, Lagoa, Faro, Portugal.

WINE.

*Report.*—Highly rich in taste; very good in composition.

## 2230. João Bernardo dos Santos, Lagoa, Portugal.

WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.

## 2231. João de Souza Donnas Boto, Ervedoza, S. João da Pesqueira, Vizeu, Portugal.

WINE.

*Report.*—Red wine; very nice taste, and in very good condition.

## 2232. Jose Maria Ramalho, Evora, Portugal.

WINES.

*Report.*—Very rich in taste; in very good condition.

## 2233. Francisco Germano Claro, Lisbon, Portugal.

WINES.

*Report.*—White and red wines; very rich; in very good condition, and perfectly well kept.

## 2234. Albino Jose de Freitas Almeida &amp; Brother, Condeixa, Coimbra, Portugal.

WINES.

*Report.*—Of very superior quality, and of remarkable taste and composition; especially the "Bastardo."

## 2235. Miguel da Veiga Cabral, Alijo, Villa Real, Portugal.

WINES.

*Report.*—Very rich, specially those of 1858; perfectly well kept.

## 2236. Miguel do Canto e Castro, Lisbon, Portugal.

WINE.

*Report.*—White wine; very rich; in very good condition.

## 2237. Marquis of Pombal, Oeiras, Lisbon, Portugal.

WINES.

*Report.*—Wine "Carcavellos;" that of 1875 very superior quality; very remarkable; those of 1836 and 1837 returned from voyage to India.

## 2238. Antonio Maria Dias P. Chaves, Mazziotti, Cintra, Lisbon, Portugal.

WINES.

*Report.*—Wine "Collares," light; very good flavor and taste; white wine very delicate; table wine very superior.

## 2239. Jose Severino Soares, Ribeira de Santarem, Portugal.

WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.

## 2240. Jose Joaquim de Sobral, Soutello de Douro, S. João de Pesqueira, Vizeu, Portugal.

WINES.

*Report.*—Very rich, and in very good condition.

## 2241. Jose Antonio Goncalves Serodio, Villa Real, Portugal.

WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.

## 2242. Custodio Jose Pinheiro, Valverde, Villa Real, Portugal.

WINE.

*Report.*—Very good table wine; delicate, fruity flavor, and perfectly well kept.

## 2243. Antonio Peixoto Pinto, Sabroza, Villa Real, Portugal.

WINE.

*Report.*—Very good table wines; delicate, fruity flavor, and very well kept.

## 2244. Sabino Jose Malter dos Anjos Galrao, Mafra, Lisbon, Portugal.

WINES.

*Report.*—Very rich, and in very good condition.

## 2245. J. H. Andresen, Oporto, Portugal.

PORT WINES.

*Report.*—Very rich.

**2246. Antonio Caetano Rodrigues & Co., Oporto, Portugal.**

## PORT WINES.

*Report.*—A remarkable collection of port wines from 1812 to 1870; richness of taste. The oldest have an extraordinarily delicate flavor.

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**2247. Antonio Gomes de Moura & Co., Oporto, Portugal.**

## PORT WINES.

*Report.*—A remarkable collection of port wines from 1834 to 1875, among which are found some of the best and most celebrated.

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**2248. Manoel Antonio Francisco Cerdeira, Godim, Regoa, Villa Real, Portugal.**

## PORT WINES.

*Report.*—Very good port wines; very rich in taste.

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**2249. Jose Maria da Fonseca, Lisbon, Portugal.**

## WINE.

*Report.*—Remarkable Palmella wines; the most delicious "Muscatel Setubal" wines. The white Muscatel, 1867, extraordinarily rich in flavor and taste. The Muscatel "roxo" highly delicate.

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**2250. Bento M. F. de Mattos, Mondim de Basto, Villa Real, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2251. Tristão Perestrello da Camara, Funchal, Madeira, Island of Madeira.**

## MADEIRA WINES.

*Report.*—Very good Madeira wines; flavor and taste very rich.

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**2252. Joaquim Ferreira de Macedo Pinto, Taboaco, Vizeu, Portugal.**

## WINES.

*Report.*—A remarkable collection of wines from 1875 back to 1834; very rich in taste.

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**2253. Guilherme da Costa Leite, St. Thirso, Oporto, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2254. Carlos João Ribeiro Lima, Melgaço, Vianna do Castelo, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2255. Antonio Lopes Vedigal Salgado, Coruche, Santarem, Portugal.**

## WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.

2256. Verissimo Ferreira A. d'Oliveira Constanca, Santarem, Portugal.

WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.

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2257. Jose Jacintho Nunes, Grandola, Lisbon, Portugal.

WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.

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2258. Francisco d'Assiz Pereira do Lago, Macedo de Cavalleiros, Bragança, Portugal.

WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.

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2259. Augusto Jose de Oliveira, Lisbon, Portugal.

WINE.

*Report.*—A very good table wine; of very good taste and good composition.

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2260. Julio Bivar d'Azevedo Salgado, Sardoal, Santarem, Portugal.

WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.

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2261. Gustavo Ferrari, Lisbon, Portugal.

WINES.

*Report.*—Very superior wines; very rich in taste; very good in composition.

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2262. Alberto Araujo Lacerda, Figueiro dos Vinhos, Leiria, Portugal.

WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.

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2263. Boaventura Doria, Covilha, Castello Branco, Portugal.

WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.

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2264. Jose Joaquim Ribeiro, S. João da Pesqueira, Vizeu, Portugal.

WINE.

*Report.*—Highly rich in taste; very good in composition.

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2265. Jose Filippe de Sá, Azoia de Baixo, Santarem, Portugal.

WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.

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2266. Roberto Augusto Pinto de Magalhaes, Alijo, Villa Real, Portugal.

WINE.

*Report.*—Very superior port wine of 1856 and 1858.



2267. Antonio Vincente d'Almeida Fernandes, Benavente, Santarem, Portugal.

## WINE.

*Report.*—Wine, red, "Bastardo 1868," of superior quality; remarkable by its composition.

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2268. Antonio Manoel Ferreira, Torres Novas, Santarem, Portugal.

## WINE.

*Report.*—White wine, "Geropiga 1875," of superior quality; remarkable by its taste and composition.

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2269. Jose Ricardo de Carvalho Figueira, Peniche, Leiria, Portugal.

## WINES.

*Report.*—Highly rich in taste; very good in composition.

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2270. Abilio Alfonso da Silva Monteiro, Malhada, Aveiro, Portugal.

## WINES.

*Report.*—Highly rich in taste; very good in composition.

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2271. Jose Justino Teixeira Monteiro, Sabroza, Villa Real, Portugal.

## WINES.

*Report.*—Very good port wine; commended for delicacy and richness of taste.

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2272. Daniel Pereira da Silva, Celorico, Guarda, Portugal.

## WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.

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2273. Jose Cameiro d'Almeida Buitrago, Torres Vedras, Lisbon, Portugal.

## WINE.

*Report.*—Of very good quality, and very well kept.

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2274. João Victorino Pereira da Costa, Torres Vedras, Lisbon, Portugal.

## WINE.

*Report.*—Very rich; in very good condition.

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2275. Conde das Alcacovas, Oeiras, Lisbon, Portugal.

## WINES.

*Report.*—Very rich, and in very good condition.

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2276. João Climaco, Jr., Torres Vedras, Lisbon, Portugal.

## WINE.

*Report.*—Red wine, very rich, and very well kept.

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2277. Jose Avellino Nunes de Carvalho, Torres Vedras, Lisbon, Portugal.

## WINE.

*Report.*—Red wine, of very good quality, and in very good condition.

2278. Jose Maximo Coelho e Souza, Goncalo, Guarda, Portugal.

WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.

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2279. João Jose Le Cocq, Castello de Vide, Portalegre, Portugal.

WINES.

*Report.*—Red wine 1863, very rich; remarkable red wine 1874, light, a very superior table wine; "Muscatel" wines, dry, very delicate, and of very good composition.

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2280. Joaquim Jose de Freitas e Silva, Cartaxo, Santarem, Portugal.

WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.

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2281. Miguel Tudella de Souza Napoles, Castelloes, Tondella, Vizeu, Portugal.

WINES.

*Report.*—Very good table wines; delicate fruity flavor, and perfectly well kept.

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2282. Francisco da Costa Leal, Alemquer, Lisbon, Portugal.

WINES.

*Report.*—Of superior quality; remarkable for taste and composition.

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2283. Fernando Affonso d'Almeida Coutinho, Coimbra, Portugal.

WINE.

*Report.*—Geropiga, Muscatel wine 1858, very palatable, and very good in composition.

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2284. Countess of Geraz do Lima, Lisbon, Portugal.

WINES.

*Report.*—"Bastardo" and "Muscatel" wines; very rich in taste and flavor; 1852 is very remarkable.

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2285. Widow Pinto & Son, Cartaxo, Lisbon, Portugal.

WINES.

*Report.*—Red wines 1874 and 1875; composition very light, and of remarkable taste. White wine, very rich.

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2286. Royal Wine Co., Oporto, Portugal.

PORT WINE.

*Report.*—A precious collection of wines from 1815 to 1873. Samples of the celebrated port wines of 1847, 1834, 1820, and 1815. The oldest are extraordinarily rich and delicate in flavor and taste. The new ones are very rich in taste.

All these wines are of a very superior quality.

**2287. Carlos R. Blandy, Funchal, Island of Madeira.****MADEIRA WINES.**

*Report.*—A precious collection of Madeira wines from 1826 to 1872. The "Boal 1846," "Sercial 1826," and "Malvasia 1826," are remarkably good; highly rich in flavor and taste. All these wines may be said to be among the most delicious of the world.

**2288. Dejante & Co., Lisbon, Portugal.****WINES.**

*Report.*—Portuguese claret (Collares), a very superior table wine, light, of good composition and very agreeable flavor; "Montebarradas" and "Ribatejo," of perfect composition, nice flavor (bouquet), rich taste. Tasted on the 26th of July, and found perfectly well kept.

**2289. João de Britto, Lisbon, Portugal.****WINE.**

*Report.*—A remarkable collection of Lisbon (termo) Collares, Lavradio, and Carcavellos wines. Very well made, and very rich in flavor and taste.

**2290. Viscount of Castello Borges, Lisbon, Portugal.****WINE.**

*Report.*—A very remarkable wine of 1854.

**2291. Dow & Co., Oporto, Portugal.****PORT WINE.**

*Report.*—Very good collection of port wine from 1856 to 1873; of remarkable flavor and taste.

**2292. Seal, Brothers, & Co., Funchal, Island of Madeira.****MADEIRA WINES.**

*Report.*—A very good collection of Madeira wines from 1828 to 1870, the celebrated "Boals 1865 and 1830," "Sercial 1830," and "Malvasia 1830." Taste and flavor very rich. Remarkable wines; among the most precious of the world.

**2293. Francisco Rapozo de Souza d'Alto, Cardafes, Lisbon, Portugal.****WINES.**

*Report.*—Remarkable red table wines, 1873 and 1874; natural and light wine; great delicacy in the taste and flavor of the wines, especially those of 1865 and 1873. Perfect in composition. Tasted on the 27th of July, and found perfectly well kept.

**2294. Jeronymo Martins & Sons, Lisbon, Portugal.****WINES.**

*Report.*—A very good collection of wines from celebrated localities in the neighborhood of Lisbon. Wines extremely rich.

**2295. Manuel Vaz Preto Geraldo, Louzan, Castello Branco, Portugal.****WINES.**

*Report.*—Red wines, very rich in taste. Those of the vintages of 1864 and 1867 are remarkable.

2296. Jose Fagaca de Carvalho é Santos, Cadaval, Lisbon, Portugal.

WINE.

*Report.*—Wine of superior quality; remarkable by its taste and composition.

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2297. João Cardozo de Souza Alvim, Alter do Chao, Portalegre, Portugal.

WINES.

*Report.*—Very delicate and very rich in flavor, especially those of 1871.

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2298. Jose Ferreira Portella, Anadia, Aveiro, Portugal.

WINE.

*Report.*—Very good table wine; delicate fruity flavor, and perfectly well kept.

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2299. Luiz Antonio Ferreira da Motta, Andraes, Villa Real, Portugal.

WINES.

*Report.*—Wines highly rich in taste, of very good composition.

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2300. Jose Victorino de Miranda, Torres Vedras, Lisbon, Portugal.

WINES.

*Report.*—Wines very rich, and in very good condition.

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2301. Felix Honorio Gomes de Miranda, Torres Vedras, Lisbon, Portugal.

WINES.

*Report.*—Red and white wines, very rich, and perfectly well kept.

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2302. Cypriano Ribeiro Calleia, Lisbon, Portugal.

WINES.

*Report.*—Table wines very good; white wines, of very superior quality and very rich.

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2303. Manuel Iglesias, Lisbon, Portugal.

WINES.

*Report.*—Red wines, very rich; Muscatel and Azinto wines, very remarkable.

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2304. Portuguese Central Royal Agriculture Association, Lisbon, Portugal.

WINES.

*Report.*—A collection of some of the best qualities of table wines from the central part of Portugal.

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2305. George Allen & Co., Lisbon, Portugal.

WINES.

*Report.*—A remarkable collection of port wines, from 1858 back to 1815; very rich.

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2306. Domingos Salgado, Bragança, Portugal.

WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.

2307. Antonio Paes Cabral Sanhorim, Nellas, Vizeu, Portugal.

WINES.

*Report.*—Very rich; very well kept.

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2308. Jose Augusto de Sá Pereira Ozorio, Lamego, Vizeu, Portugal.

WINE.

*Report.*—Red wine, highly rich in taste, very good in composition.

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2309. Balthazar Peres Ramirez, Evora, Portugal.

WINES.

*Report.*—Very rich in taste; in good condition; the white wine of 1875 especially good.

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2310. Diogo Rangel, Torres Novas, Santarem, Portugal.

WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.

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2311. Luiz Antonio Martins, Torres Vedras, Lisbon, Portugal.

WINE.

*Report.*—White wine; of very good taste, and very well kept.

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2312. Dionisio Antonio Neres de Carvalho, Peniche, Leiria, Portugal.

WINE.

*Report.*—Very rich; in very good condition.

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2313. Antonio Vicente dos Santos, Alhandra, Lisbon, Portugal.

WINE.

*Report.*—Red wine, light; genuine; taste and flavor remarkable; a very good table wine. White wine, highly delicate. Tasted in July, and found perfectly well kept.

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2314. Antonio da Silva Paes, S. João d'Areas, Vizeu, Portugal.

WINES.

*Report.*—Highly rich in taste; very good in composition.

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2315. Cardozo Jr., Setubal, Lisbon, Portugal.

WINES.

*Report.*—A good collection of wines; of nice taste and very good condition.

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2316. Couns. João Rebello da Costa Cabral, Lisbon, Portugal.

WINES.

*Report.*—Very rich; in very good condition; remarkably, those of 1873.

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2317. Carlos Zeferino Pinto Coelho, Largo do Carmo, Lisbon, Portugal.

WINES.

*Report.*—Remarkable wines, "Carcavellos;" exceedingly rich in taste and flavor.

2318. Francisco Antonio Fialho, Reguengo, Evora, Portugal.

WINE.

*Report.*—Very rich; in very good condition.

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2319. Manoel Antonio de Mattos, Campo Maior, Portalegre, Portugal.

WINES.

*Report.*—Very rich; in very good condition.

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2320. D. Carlotta de Sampaio Veiga Cabral, Alijo, Villa Real, Portugal.

WINES.

*Report.*—Red wines very rich; remarkably, those of 1840; in very good condition.

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2321. Ezequiel de Paula Sá Prego, Alemquer, Lisbon, Portugal.

WINE.

*Report.*—Very rich; very good in composition.

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2322. Jose Antonio Tavares, Alemquer, Lisbon, Portugal.

WINE.

*Report.*—Of superior quality; remarkable by its taste and composition.

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2323. Antonio Jose Tavares, Covilha, Castello Branco, Portugal.

WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.

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2324. Manuel Lopes de Souza, Guarda, Portugal.

WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.

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2325. Jose da Conceição Guerra, Elvas, Portalegre, Portugal.

WINES.

*Report.*—Very delicate; flavor remarkable.

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2326. Jose de Souza Baracho, Torres Novas, Santarem, Portugal.

WINE.

*Report.*—Very rich; in very good condition.

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2327. Widow Barreto, Covilha, Castello Branco, Portugal.

WINE.

*Report.*—Highly rich in taste; very good in composition.

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2328. Countess of Anadia, Lisbon, Portugal.

WINES.

*Report.*—Very rich, and perfectly well kept.

**2329. Jose Pinheiro, Alcoentre, Lisbon, Portugal.**

WINES.

*Report.*—Very rich; in very good condition.**2330. Guilherme Francisco Pereira Nunes, Oliveira do Hospital, Coimbra, Portugal.**

WINE.

*Report.*—Highly rich in taste; of very good composition.**2331. João Campello Trigueiros Martel, Sacarem, Lisbon, Portugal.**

WINE.

*Report.*—Red wine, 1830; remarkable wines, 1874; in excellent condition.**2332. Viscount of Abrigada, Lisbon, Portugal.**

WINES.

*Report.*—Red wine, Lavradio, very good; white wines, very remarkable.**2333. Fernando Maria Bacellar, Torres Vedras, Lisbon, Portugal.**

WINE.

*Report.*—White wine, 1875, remarkable for its nice flavor; of very good composition.**2334. Antonio Simoes Oliveira, Castro Daire, Vizeu, Portugal.**

WINE.

*Report.*—Highly rich in taste; of very good composition.**2335. Francisco Jose de Bastos é Silva, Torres Vedras, Lisbon, Portugal.**

WINE.

*Report.*—Wines of very superior quality.**2336. Amancio Antonio de Sequeira Freire, Alemquer, Lisbon, Portugal.**

WINE.

*Report.*—Wines of superior quality; remarkable by their taste and composition.**2337. Carlos Relvas, Gollega, Portugal.**

WINES.

*Report.*—Remarkable white wines, specially those of 1846.**2338. Jose Ferreira Roquette, Salvaterra de Magos, Santarem, Portugal.**

WINES.

*Report.*—Wines of a very superior quality; the red is remarkably good.**2339. Antonio de Sá Pereira, Velha, Bragança, Portugal.**

WINE.

*Report.*—Very good table wine; delicate fruity flavor, and perfectly well kept.

**2340. Count of Atalaya, Almeirim, Santarem, Portugal.****WINES.**

*Report.*—Red and white wines; very good taste, notably the red wines of 1870 and the white ones of 1870 and 1871; in very good condition, and very well kept.

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**2341. Antonio Joaquim Potes de Campos, Evora, Portugal.****WINES.**

*Report.*—Wines of superior quality; remarkable by their taste and composition.

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**2342. Count of Junqueira, Almeirim, Santarem, Portugal.****WINES.**

*Report.*—Red wines, nice taste and good condition.  
White wines, delicate, especially those of 1870.

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**2343. Domingos A. de Moraes, Vinhaes, Bragança, Portugal.****WINE.**

*Report.*—Very good table wine; delicate fruity flavor, and very well kept.

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**2344. Antonio Fernando Coelho, Jr., Caldas da Rainha, Leiria, Portugal.****WINES.**

*Report.*—White; very rich; perfectly well kept.

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**2345. Antonio Nunes dos Reis, Torres Vedras, Lisbon, Portugal.****WINES.**

*Report.*—A remarkable collection of wines from Torres Vedras, of 1854 to 1875. The white ones are very rich in flavor, especially those of 1854 and 1862. The new red wines are light, and very good for table purposes.

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**2346. Antonio Bernardino Miranda, Moncorvo, Bragança, Portugal.****WINE.**

*Report.*—Wine highly rich in flavor and taste; of very good composition.

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**2347. Francisco Simoes Margiochi, Jr., Lisbon, Portugal.****WINE.**

*Report.*—White wine, light and remarkably delicate.  
Tasted in July, and found perfectly well kept.

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**2348. João Antonio Rodrigues, Grandola, Lisbon, Portugal.****WINE.**

*Report.*—Wine of superior quality; remarkable by its taste and composition.

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**2349. Francisco Maria Ribeiro, Couto de Cima, Vizeu, Portugal.****WINE.**

*Report.*—Very good table wine; delicate fruity flavor, and perfectly well kept.



## 2350. Jacintho Lopes, Elvas, Portalegre, Portugal.

## WINES.

*Report.*—Wines highly rich in taste; of very good composition.

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## 2351. João Rodrigues de Deos, Torres Novas, Santarem, Portugal.

## WINE.

*Report.*—Wines of superior quality; remarkable by their taste and composition.

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## 2352. Dr. Manoel de Barros Nobre Tavora, Taboaco, Vizeu, Portugal.

## WINE.

*Report.*—Wine highly rich in taste; of very good composition.

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## 2353. Manuel Marcal de Mendonca, Olhão, Faro, Portugal.

## WINE.

*Report.*—Wine highly rich in taste; of very good composition.

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## 2354. Jose Olaia Lopes, Castello Branco, Portugal.

## WINES.

*Report.*—A collection of wines highly rich in taste; of very good composition.

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## 2355. Eduardo d'Oliveira Soares, Evora, Portugal.

## WINE.

*Report.*—Wine of superior quality; remarkable by its taste and composition.

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## 2356. Jose Maria Fernandes Falcão, Cadafae, Alemquer, Lisbon, Portugal.

## WINES.

*Report.*—White wine, "Diagalves," 1873; very delicate, and of remarkable flavor.

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## 2357. D. Maria Jose Perpetua Marques Redondo, Evora, Portugal.

## WINE.

*Report.*—Highly rich in taste.

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## 2358. Francisco Costa, Lisbon, Portugal.

## WINE.

*Report.*—Red wine, "Collares," very superior; light, delicate in taste, with a very good and peculiar flavor (bouquet). One of the best wines tasted. Tasted in July, and found perfectly well kept

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## 2359. Constantino de Valle Coelho Cabral, Oporto, Portugal.

## PORT WINE.

*Report.*—A remarkable collection of port wines, presenting the wines of the celebrated vintages of 1847, 1834, and 1815. Taste and flavor highly delicate.

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## 2360. Edward Kebe &amp; Co., Restauracão, Oporto, Portugal.

## PORT WINES.

*Report.*—A very good collection of port wines from 1825 to 1874; flavor and taste very rich.

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## 2361. D. Henriqueta Julia Pereira, Torres é Oliveira Fundão, Castello Branco, Portugal.

## WINES.

*Report.*—Wines "Bastardo" and "Malvasia;" highly rich in taste, and of very good composition.

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## 2362. Ferreira &amp; Dourado, Oporto, Portugal.

## PORT WINES.

*Report.*—Port wines from 1851 to 1875; remarkably rich in flavor and taste.

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## 2363. Francisco Paes de Mattos Falcão, Bringel, Beja, Portugal.

## WINES.

*Report.*—Highly rich in taste; of very good composition.

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## 2364. Francisco Abranches do Amaral Guerra, Coimbra, Portugal.

## WINES.

*Report.*—Highly rich in taste; of very good composition.

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## 2365. Candido Manoel Pereira, Lavradio, Barreiro, Lisbon, Portugal.

## WINES.

*Report.*—Highly rich in taste; of very good composition.

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## 2366. Jose Cabrita Nunes, Lagoa, Faro, Portugal.

## WINE.

*Report.*—Highly rich in taste; of very good composition.

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## 2367. Joaquim Ribeiro de Almeida, Campanha de Baixo, Oporto, Portugal.

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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## 2368. Jose Ferreira da Silva Azevedo, Rates, Povoá de Varzim, Oporto, Portugal.

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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## 2369. Jose Joaquim de Almeida, Semelhe, Braga, Portugal.

## WINES.

*Report.*—Very good table wines; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

**2370. Ascencio Jose dos Santos, Valença, Vianna do Castello, Portugal.****WINE.**

*Report.*—Very good table wine; light, and of very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2371. Viscount of Montariol, Saint Victor, Braga, Portugal.****WINE.**

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2372. Camillo de Macedo, Jr., Pezo da Regoa, Villa Real, Portugal.****PORT WINE.**

*Report.*—A superior collection of port wine from 1805 to 1874; flavor and taste very delicate; remarkably, those of 1834 and 1805.

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**2373. João Manoel Esteves, Gondomil, Valença, Vianna do Castello, Portugal.****WINE.**

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2374. Antonio Joaquim de Moura Coutinho, Outeiro, Cabeceiras de Basto, Braga, Portugal.****WINE.**

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2375. Leacock & Co., Funchal, Island of Madeira.****MADEIRA WINES.**

*Report.*—Madeira wines of a very superior quality; flavor and taste remarkably rich.

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**2376. J. J. Rodrigues Leitão & Sons, Funchal, Island of Madeira.****MADEIRA WINES.**

*Report.*—Very good Madeira wines; flavor and taste very rich.

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**2377. Domingos Carneiro de Oliveiro, Agrella, Oporto, Portugal.****WINE.**

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2378. Jose de Vasconcellos Carneiro e Menezes, Marco de Canavezes, Oporto, Portugal.****WINE.**

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found very well kept.

## 2379. Henrique Jose Maria Camacho, Funchal, Island of Madeira.

## MADEIRA WINES.

*Report.*—A very good collection of Madeira wines from 1844 to 1870; remarkably, "Malvasia, 1860," and "Boal, 1844;" flavor and taste highly rich.

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## 2380. C. N. Kopke &amp; Co., Massarellas, Oporto, Portugal.

## PORT WINES.

*Report.*—A large collection of port wines, of a very rich taste; among which are found the celebrated wines of 1847 and 1834.

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## 2381. Christiano Augusto da Silva Moura, Midoes, Taboa, Coimbra, Portugal.

## WINES.

*Report.*—Highly rich in taste; of very good composition.

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## 2382. João Alves Morgado, Constança, Santarem, Portugal.

## WINES.

*Report.*—Highly rich in taste; of very good composition.

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## 2383. Manoel Augusto Pereira, Lisbon, Portugal.

## WINES.

*Report.*—A remarkable collection of wines from the neighborhood of Lisbon.

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## 2384. Joaquim Jose da Guerra, Elvas, Portalegre, Portugal.

## WINES.

*Report.*—Wines very rich in taste, 1867 to 1869; very good table wines, made by the process of Professor A. de Aguiar, called in Portugal "Balças dansantes."

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## 2385. Jose Maria da Silva Tacho, Fragosella, Vizeu, Portugal.

## WINE.

*Report.*—Wine of superior quality; remarkable by its taste and composition.

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## 2386. Bernardo Augusto Lopes &amp; Co., Figueira, Coimbra, Portugal.

## WINE.

*Report.*—Very rich; in very good condition.

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## 2387. Sebastião Alvares, Borba, Evora, Portugal.

## WINE.

*Report.*—Very rich in taste; of very good composition.

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## 2388. Ignacio Cardozo de Benos Caldeira Castel, Branco, Portalegre, Portugal.

## WINES.

*Report.*—Highly rich in taste; of very good composition.

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## 2389. José Maria da Silva, Elvas, Portalegre, Portugal.

## WINE.

*Report.*—Highly rich in taste; of very good composition.

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2390. João Felix de Faria Almeida Freixedas, Castello de Vide, Portalegre, Portugal.

WINES.

*Report.*—Highly rich in taste; of very good composition.

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2391. Manoel Teixeira Pinto Cambres, Lamego, Vizeu, Portugal.

WINES.

*Report.*—Of superior quality; remarkable for their taste and composition.

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2392. Joaquim Avelino Cumieira, Santa Martha, Villa Real, Portugal.

WINES.

*Report.*—Highly rich in taste; of very good composition.

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2393. Antonio José Rodrigues Vidal, Vaccarica, Mealhada, Aveiro, Portugal.

WINES.

*Report.*—Highly rich in taste; of very good composition.

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2394. Antonio Pedro Judice Biker, Lagoa, Faro, Portugal.

WINE.

*Report.*—Red wine; of very rich taste, and in very good condition.

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2395. Domingos Affonso Almada, Lisbon, Portugal.

WINES.

*Report.*—Very rich in flavor and taste. Particularly remarkable are the "Collares" and "Lavradio" wines.

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2396. Pedro Jose de Mesquita Sinde, Taboa, Coimbra, Portugal.

WINE.

*Report.*—White wine; highly rich in taste, of very good composition.

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2397. Jose Maria Forbes, Santar, Nellas, Vizeu, Portugal.

WINES.

*Report.*—Very rich; in very good condition.

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2398. Ferraz & Choque, Lisbon, Portugal.

WINES.

*Report.*—Very rich; in very good condition.

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2399. Peres Pereira Sons & Co., Lisbon, Portugal.

WINE.

*Report.*—Very rich; in very good condition.

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2400. Heirs of Jose Ferreira Pinto Basto, Coimbra, Portugal.

WINES.

*Report.*—Very rich; in very good condition.

**2401. Adelino d' Almeida Vasconcellos, Nellas, Vizeu, Portugal.**

WINE.

*Report.*—White wine; taste highly delicate; very nice flavor.**2402. Luis A. d'A. Macedo, Estremoz, Evora, Portugal.**

WINES.

*Report.*—Very rich; in very good condition.**2403. Manuel Jose Martins, Gondomil, Valença, Portugal.**

WINE.

*Report.*—Very good table wine, light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.**2404. Abecassis Brothers, Lisbon, Portugal.**

WINES.

*Report.*—A collection of port wines; very rich in taste.**2405. Widow Theotónio Pereira & Sons, Lisbon, Portugal.**

WINES.

*Report.*—A remarkable collection of wines from Lavradio, Collares, and Lisbon; of very rich taste and perfect composition.**2406. Domingo Alves Machado, Celorico de Basto, Braga, Portugal.**

WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.**2407. Antonio Joaquim Fernandes Lima, Villa Nova da Cerveira, Portugal.**

WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.**2408. Henrique Nunes Vizeu, Santar, Nellas, Vizeu, Portugal.**

WINE.

*Report.*—A very superior wine; of very remarkable taste.**2409. Viscount of the Esperanca, Evora, Portugal.**

WINES.

*Report.*—Very rich in taste, and in very good condition.\***2410. Viscount of the Esperanca, Cuba, Portalegre, Portugal.**

WINES.

*Report.*—Red wines, very rich in taste; white wines, of a superior quality.

**2411. Widow Fevelim & Sons, Torres Vedras, Lisbon, Portugal.****WINES.**

*Report.*—Red and white wines; very superior.

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**2412. Viscount of Carnide, Quinta Grande, Carnide, Lisbon, Portugal.****WINES.**

*Report.*—Very remarkable for their flavor and taste; very good composition. Tasted in July, and found perfectly well kept.

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**2413. Viscount of Mossamedes, Quinta da Luz, Belem, Lisbon, Portugal.****WINE.**

*Report.*—Red wine, perfectly well composed; very good as table wine; naturally light, and of nice flavor (bouquet).

White wine, very delicate.

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**2414. Lourenco da Cunha Sotto Mayor, S. Martinho de Dume, Braga, Portugal.****WINE.**

*Report.*—A very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found very well kept.

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**2415. Antonio Lopes da Silva, Balazar, Oporto, Portugal.****WINE.**

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very rich composition. Tasted in July, and found perfectly well kept.

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**2416. Manuel de Souza Rangel, Penafiel, Oporto, Portugal.****WINE.**

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2417. Joaquim Ferreira dos Santos, S. Martinho do Campo, Oporto, Portugal.****WINE.**

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2418. J. M. Goncalves Roma, Troviscozo, Mousão, Portugal.****WINE.**

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2419. Jose de Sequeira Pinto Queiroz, Caes Novo, Dargue, Vianna do Castello, Portugal.****WINE.**

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

**2420. M. A. P. Ramos Faria, Celorico de Basto, Braga, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2421. Antonio Xavier Torres é Silva, Caminha, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found very well kept.

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**2422. Manuel Lopes Albuquerque, Alvito, Barcellos, Braga, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2423. Antonio Jose de Souza é Silva, Vallongo, Oporto, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2424. Joaquim Jose de Souza, Paredes de Coura, Vianna do Castello, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2425. Jose Nunes de Souza Peixoto, Penafiel, Oporto, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2426. Jose Pereira de Castro Pecanha, Vianna do Castello, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2427. A. Casa de Passos, Barcellos, Braga, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found very well kept.

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**2428. Augusto Cezar Carvalho Valle Vasconcellos, Carez, Braga, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.



**2429. Jose Luiz Rodrigues de Souza, Valença, Vianna do Castello, Portugal.**

WINE.

*Report.*—Very good table wine; light, and very good flavor (bouquet); superior composition. Tasted in July, and found perfectly well kept.

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**2430. João Pacheco Teixeira, Celorico de Basto, Braga, Portugal.**

WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); very good composition. Tasted in July, and found perfectly well kept.

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**2431. Manoel de Souza Dias Valle, Oporto, Portugal.**

WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2432. Jose Henrique Coelho de Souza, Cabeceiras de Basto, Braga, Portugal.**

WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2433. Antonio Luiz Gomes, Valença, Vianna do Castello, Portugal.**

WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2434. Joaquim Apolinario da Fonseca, Valença, Vianna do Castello, Portugal.**

WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2435. Baron of Nellas, Nellas, Vizeu, Portugal.**

WINE.

*Report.*—Wine very rich; in very good condition.

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**2436. Victorino Barboza da Costa Guimarães, Penafiel, Oporto, Portugal.**

WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2437. Francisco P. Carvalho Valle Vasconcellos, Cabeceiras de Basto, Braga, Portugal.**

WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

**2438. Pedro Martins Vieira, Cabeceiras de Basto, Braga, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2439. Bento M. Pereira, Pita Vasconcellos, Monsão, Vianna do Castello, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2440. Bernardino Alves Teixeira Cunha, Celorico de Basto, Braga, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2441. Damião Martins de Castro, Gondomar, Oporto, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2442. Francisca Albertina de Faria, Pova de Varzim, Oporto, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2443. Maria H. da Silva Alcoforado, Barcellos, Braga, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2444. Custodio Gil dos Reis Carneiro, St. Thirso, Oporto, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2445. Manuel Jose Teixeira Basto, Cabeceiras de Basto, Braga, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

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**2446. Antonio Fernandes Moraes, Abelheira, Vianna do Castello, Portugal.**

## WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

**2447. Jose Teixeira de Carvalho, Cabeceiras de Basto, Braga, Portugal.**

WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

**2448. Baron of Calvario, Penafiel, Oporto, Portugal.**

WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

**2449. F. Cabral Paes & Sons, Sernache, Vizeu, Portugal.**

WINES.

*Report.*—Very rich; in very good condition.

**2450. Jeronymo d'Almeida Coelho de Bivar, Portimão, Faro, Portugal.**

WINES.

*Report.*—Very rich; in very good condition.

**2451. A. Augusto da Silva, Lisbon, Portugal.**

WINES.

*Report.*—A collection of wines highly rich in taste; of very good composition.

**2452. Jacintho Marquis, Silgueiros, Vizeu, Portugal.**

WINES.

*Report.*—Highly rich in taste; of very good composition.

**2453. Dr. Jose Rodrigues Cerveira, Anadia, Aveiro, Portugal.**

WINE.

*Report.*—White wine, 1864; very delicate, and of remarkable flavor.

**2454. Luiz Manoel Alves de Moura, Celorico de Basto, Braga, Portugal.**

WINE.

*Report.*—Very good table wine; light, and very nice flavor (bouquet); of very good composition. Tasted in July, and found perfectly well kept.

**2455. Jose Duarte Lima, Cartaxo, Santarem, Portugal.**

WINES.

*Report.*—Of superior quality; remarkable by their taste and composition.

**2456. Antonio Montes Champalimaud, Regoa, Villa Real, Portugal.**

PORT WINES.

*Report.*—A very good collection of port wines, very rich in flavor and taste.

**2457. Remigio Rojo, Panas, Mexico.**

RED WINE.

*Report.*—In very fine condition; of good taste.

## 2458. L. Vallauri, Constantinople, Turkey.

## CYPRUS WINE.

*Report.*—Fine, strong flavor; rich in body, and very mild.

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## 2459. Turkish Government.

## RASPBERRY WINE AND WINE OF MONASTIR.

*Report.*—Very good fruit wine; strong-bodied, fine quality, and in excellent condition.

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## 2460. W. H. Dalziel, Varna, Turkey.

## RED WINE.

*Report.*—Very good wine, of the Bordeaux kind; good flavor; fine bouquet, and in excellent condition.

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## 2461. Bano, Adana, Turkey.

## WINE.

*Report.*—Very pleasant wine, in very good condition and of excellent quality.

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## 2462. P. Oglu, Salonica, Turkey.

## MACEDONIAN WINE.

*Report.*—Fair table wine, of good quality, in good condition, and of fine taste.

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## 2463. Company for the Cultivation of Vineyards, Broussé, Turkey.

## DRY WHITE WINE.

*Report.*—Good quality; well conditioned, and with an agreeable taste.

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## 2464. G. L. Vaphiades, Salonica, Turkey.

## RED WINE.

*Report.*—Wine of 1875; good bouquet; fine quality, and in excellent condition.

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## 2465. G. L. Mark, Island of Samos, Turkey.

## MUSCAT WINE.

*Report.*—Very agreeable wine, of fine quality, of good bouquet, and in excellent condition.

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## 2466. Otto Freygang, Rio Grande do Sul, Brazil.

## ORANGE WINE AND CORDIALS.

*Report.*—Tonic wine made from oranges, of great reputation and very good; also a large assortment of fine and well-prepared cordials, of fine flavor, good bouquet, and excellent quality.

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## 2467. J. F. Mattos Pimenta, Campos, Rio de Janeiro, Brasil.

## SAGUAREMA WINE.

*Report.*—Delicious wine, exceptionally good; of first quality, and very well conditioned.

**2468. M. L. de Carvalho, Bahia, Brazil.****ORANGE WINE.**

*Report.*—Fine orange wine, of superior quality.

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**2469. F. J. Lepage, Minas Geraes, Brazil.****ORANGE WINE.**

*Report.*—Very good wine, of very fine taste, excellent quality, and in extra good condition.

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**2470. J. J. A. Braz, São Paulo, Brazil.****IMPERIAL WINE.**

*Report.*—Very delicate wine, made from the pure Isabella grapes; has very fine bouquet, and is of an excellent good quality.

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**2471. D. F. V. Perdiggão, Maranhão, Brazil.****CAJU WINE.**

*Report.*—Very delicate wine; of good quality, delicious taste, and in very good condition.

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**2472. J. do Amaral Rapozo, Pernambuco, Brazil.****CAJU WINE.**

*Report.*—Very good and exquisite wine, made from the caju fruits. A specialty in Brazil.

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**2473. F. P. Vasconcellos, Bahia, Brazil.****CAJU WINE.**

*Report.*—An excellent wine from caju fruits; of very good quality, fine bouquet, and very well conditioned.

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**2474. F. L. Carreira, Ceará, Brazil.****ASSORTED WINES.**

*Report.*—A large assortment of wines, made from Brazilian fruits, of excellent quality, deliciously good, and kept in a very good condition.

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**2475. Louis A. Franco, Catamarca, Argentine Republic.****WINE.**

*Report.*—A white Torrontes wine of 1873, excellent in condition, and good in flavor and taste, which only needs proper treatment to make it a very prominent wine.

---

**2476. Hilario Lemaistre, Mendoza, Argentine Republic.****WINE.**

*Report.*—A variety of La Plata wines, white and red, dry and sweet, which show very good treatment, and are excellent in character, taste, and aroma.

---

**2477. Bonifacio Davila, Rioja, Argentine Republic.****WINE.**

*Report.*—"Pinot" wine from San Nicolas; excellent in flavor, taste, and sweetness, but of a certain acidity which might be modified by proper treatment. If successful, this would make it a valuable wine.

**2478. Froilan Muro, Catamarca, Argentine Republic.**

## WINE.

*Report.*—A white wine from Colegio; excellent in condition and very good in taste and flavor.

---

**2479. Eugenio Guerin, Mendoza, Argentine Republic.**

## WINE.

*Report.*—The red wine "trapiche" of 1874 is the best of the large number of red wines of the Republic which were submitted. It is good in flavor and taste, and of heavy body; well kept. That of 1873 is lighter, but the taste not so agreeable.

---

**2480. Francisco Alvarez, Rioja, Argentine Republic.**

## WINES.

*Report.*—Several samples of white wines from Mallingasta, of great promise, having a peculiar and, to some, not agreeable flavor, which could perhaps be overcome by careful cultivation and treatment and would make these very estimable wines.

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**2481. José E. Doncel, San Juan, Argentine Republic.**

## WINE.

*Report.*—Wine from Trinidad; excellent in condition and very good in taste, but of an aroma which could be modified by proper treatment, making this wine a very estimable one.

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**2482. F. M. Coll, San Juan, Argentine Republic.**

## WINE.

*Report.*—A very good red wine from the Bordeaux grape, which promises much in this favored climate under proper treatment.

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**2483. Enrico del Bono, Syracuse, Italy.**

## FRUITS AND WINE.

*Report.*—A fine and mild wine; of good quality, of excellent bouquet, and in very good condition.

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**2484. Manissera Brothers, Alba, Italy.**

## WINE.

*Report.*—Very good table wine.

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**2485. Raphaël Budini, Tuscany, Italy.**

## RED WINE.

*Report.*—Very good table wine, cheap, and in very good condition.

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**2486. Arthur I. Strutt, Civita Lavinia, Rome, Italy.**

## TABLE WINE AND RED TABLE WINE.

*Report.*—A fine wine; has a good taste, fine quality, and in a good condition. Also a splendid red table wine, of very fine quality, delicious bouquet, in excellent condition, and extremely cheap.

## 2487. A. C. Gianoli, Ghemme, Italy.

## VARIETY OF TABLE WINES.

*Report.*—A very fine collection of the most important wines, as from 1865 to 1875; all in perfect order, with very fine bouquet, and of sound, good quality.

## 2488. Antonio Salibra, Syracuse, Italy.

## WHITE WINE.

*Report.*—White wine, called Albanello; fine bouquet, beautiful and delicious flavor.

## 2489. Ignazio &amp; Vincenzo Florio, Palermo, Italy.

## MARSALA AND MALVASIA WINE.

*Report.*—Excellent wines. The wines are of good quality, of delicious bouquet, kept in first-class order, and prepared with the greatest care.

## 2490. Dr. Augusto Malatesta, Modena, Italy.

## TABLE WINE.

*Report.*—Very good wine, in bottles and in casks; of splendid bouquet, good quality, cheap, and well conditioned.

## 2491. Chev. Giraltoni, Bologna, Italy.

## DRY WHITE WINE.

*Report.*—Good wine; of fine flavor and excellent good quality.

## 2492. Enological Society Scandiano, Scandiano, Italy.

## WHITE WINE.

*Report.*—Excellent wine, of good quality, very delicate bouquet, and in excellent condition.

## 2493. Giovanni Ravinale, Alba, Italy.

## WINE.

*Report.*—Superior Barolo wine, of excellent quality, good bouquet, and in excellent condition.

## 2494. Victor Grand Perrin, Bologna, Italy.

## DRY WHITE WINE AND SPARKLING WINE.

*Report.*—Excellent wine, of good quality, fine bouquet, and in very good condition.

## 2495. Marquis de Cortanze Vittorio, Turin, Italy.

## RED AND WHITE WINE.

*Report.*—Very good Grignolino wine, of very agreeable bouquet.

## 2496. Giovanni Ortolani, Treviso, Italy.

## RED AND SPARKLING WINE.

*Report.*—A very good, superior wine, purely from the grapes; of good quality, fine bouquet, and in very good condition.

**2497. Unione Enofila, Asti, Italy.**

RED AND WHITE WINES, ITALIAN CHAMPAGNE, AND VERMOUTH.

*Report.*—Very good wine, of excellent quality, delicious bouquet, and in very good condition; Vermouth well prepared and in very good condition.

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**2498. D'Ali & Bordonaro, Trapani, Italy.**

MARSALA WINE.

*Report.*—Of excellent bouquet and very good quality.

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**2499. Conti da Schio Brothers, Vicenza, Italy.**

WINE.

*Report.*—Well-conditioned wine, of sound, good quality, and very cheap.

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**2500. Comm. Ubaldino Peruzzi, Florence, Italy.**

RED WINE.

*Report.*—Very excellent wine, of fine color, good quality, delicious bouquet, and in a very good condition.

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**2501. Count Senatore Luigi Torelli, Milan, Lombardy, Italy.**

RED LIGHT WINE.

*Report.*—A very excellent red light table wine; of exquisite bouquet, and deliciously good.

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**2502. Luigi Galloni, Rome, Italy.**

RED TABLE WINE.

*Report.*—A very good table wine; agreeable to the taste, and pure.

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**2503. Andrea Carlo Gabaldoni, Verese, Ligure, Italy.**

RED TABLE WINE.

*Report.*—Very good table wine; agreeable to the taste, cheap, and pure.

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**2504. Conte Pier Pompeo Masetti, Florence, Italy.**

DESSERT WINE.

*Report.*—A good dessert wine, and very cheap.

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**2505. Marchesi Giovanni & Agostino Albergotti Brothers, Arezzo, Italy.**

RED WINE.

*Report.*—A fine red light wine, of fine bouquet, good quality, and fair price.

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**2506. Conte Antonio Baldelli, Tuscany, Italy.**

DRY RED WINE.

*Report.*—A good red wine, and cheap.



## 2507. Marquis Carlo Mortilarodi Villarena, Palermo, Italy.

## RED MALAGA WINE AND WHITE WINE.

*Report.*—Very good wine, of delicious bouquet, superior quality, and in excellent condition.

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## 2508. Bardi Sarzelli, Count Ferdinando, Tuscany, Italy.

## RED WINE FROM 1871.

*Report.*—A very good table wine, and extremely cheap.

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## 2509. Francica Brothers, Monteleone, Italy.

## RED WINE.

*Report.*—A very good wine, of fine quality, good bouquet, and in excellent condition.

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## 2510. Antonio Baldini, Tuscany, Italy.

## DRY RED WINES FROM 1869 TO 1875.

*Report.*—A good wine, of fine bouquet, in good condition, and very cheap.

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## 2511. Marchese Paolo Farinola, Tuscany, Italy.

## RED WINE.

*Report.*—An excellent table wine, with a very fine taste, and kept in a very good condition.

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## 2512. Camillo Puliti, Tuscany, Italy.

## RED WINE.

*Report.*—A good wine, in good condition, and very cheap.

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## 2513. Degli Albizzi, Marches Vittorio, Tuscany, Italy.

## RED WINES OF 1869, '74, '75.

*Report.*—Good table wines, in very good condition.

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## 2514. Avvocato Ippolito Pestellini, Tuscany, Italy.

## RED WINE OF 1874.

*Report.*—Good table wine, especially recommended for being pure and cheap.

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## 2515. Chev. Francisco Lawley, Tuscany, Italy.

## RED WINE.

*Report.*—Very good wine, with fine bouquet, and in an excellent condition.

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## 2516. Budini &amp; Gattai, Tuscany, Italy.

## RED TABLE WINE.

*Report.*—Good wine, of fine quality, excellent bouquet, and in a very good condition.

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## 2517. Luigi Greco Cassia, Syracuse, Italy.

## MUSCAT WINE.

*Report.*—Good dessert wine, in a very good condition.

**2518. Baron Francesco Mannino, Catania, Italy.**

DRY WHITE WINE.

*Report.*—Good table dry white wine, and cheap.**2519. Melfi Giovanni Battista, Baron di Sant' Antonio, Syracuse, Italy.**

DESSERT WHITE WINE.

*Report.*—An excellent wine. Highly recommended for its fine flavor and cheap price. Has a very agreeable bouquet, and is perfectly well preserved.**2520. Raffaele Lanzara, Salerno, Italy.**

DRY WHITE WINE.

*Report.*—Of very fine bouquet, and in a very good condition.**2521. Dr. Felice Maltese, Vittoria, Scoglitti, Italy.**

WHITE DRY WINE.

*Report.*—Very good wine, of fine bouquet and taste.**2522. Michele Rossi, Syracuse, Italy.**

MUSCAT WINE.

*Report.*—Excellent dessert wine, of very fine quality, delicious taste, and in a very good condition; cheap.**2523. Chev. Giovanni Boschiero, Asti, Italy.**

RED TABLE WINE.

*Report.*—Very good wine, of excellent bouquet, and in a very good condition.**2524. F. Rosso Tedeschi, Catania, Italy.**

RED DESSERT WINE.

*Report.*—A delicious dessert wine; it tastes of the grape, and is very sweet.**2525. Antonio Bertoldi, Negrar, near Verona, Italy.**

TABLE WINE.

*Report.*—Very fine Valpolicella wine of 1874; good quality, fine bouquet, and in excellent condition.**2526. Baron Bettino Ricasoli, Florence, Italy.**

VARIETY OF TABLE WINES.

*Report.*—A very fine collection of the choicest brands of wines; good quality, fine bouquet, excellent condition, and made entirely from the best grapes.**2527. Enological Society Valtellinese, Sondrio, Italy.**

VARIETY OF WINES.

*Report.*—The exhibits of this society are remarkably good, and of first quality. Among their specialties are Grunello wine, Inferno wine, Sassella wine, all delicious. They sell very cheap.

## 2528. Niccoló Jenò de Coronei, Rossano, Calabria, Italy.

## TABLE WINE.

*Report.*—A very good wine; of fine bouquet; good preparation; cheap.

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## 2529. Angelo Guffanti, Voghera, Italy.

## TABLE WINE.

*Report.*—A wine of fine quality, good bouquet, and finely prepared.

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## 2530. Pietro Bosco &amp; Sons, Brá, Italy.

## TABLE WINE.

*Report.*—A superior red wine; of very good quality, fine bouquet, and kept in exceptionally good condition.

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## 2531. Cavasocca Mazzanita B., Verona, Italy.

## TABLE WINE.

*Report.*—A very good wine; of fine quality, good bouquet, and in excellent condition.

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## 2532. Rossi Carlo, Quinto di Valpantena, Verona, Italy.

## TABLE WINE.

*Report.*—A table wine of extra good quality, fine bouquet, and prepared with the greatest care. It is very cheap.

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## 2533. Del Settimo, Negarine, Verona, Italy.

## WINE.

*Report.*—A very good wine for exportation; good quality, excellent bouquet, and very well conditioned.

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## 2534. G. Bon Gagliasso, Commendatore, Masserano, Italy.

## WINES.

*Report.*—A thin table wine; good, cheap, and in excellent condition.

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## 2535. Cavalier Gaetano Adorno Puma, Syracuse, Italy.

## DESSERT WINE.

*Report.*—A good wine; of fine bouquet, and in a very good condition. It sells very cheap.

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## 2536. Giuseppe Napoli, Salerno, Italy.

## TABLE WINE.

*Report.*—A good white table wine; of good quality, fine bouquet, cheap, and in a very good condition.

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## 2537. Chev. Stella Nunzio, Syracuse, Italy.

## WHITE WINE FOR DESSERT.

*Report.*—A remarkably good dessert wine, with the real flavor of grapes; good quality, fine bouquet, and in excellent condition.

## 2538. Chev. Salvatore Lanza, Syracuse, Italy.

## MUSCAT WINE.

*Report.*—An excellent wine; of delicious flavor, and in very good condition.

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## 2539. Marquis of Villamarina, Cagliari, Italy.

## TABLE WINE.

*Report.*—A good wine; of very fine quality, good bouquet, and in very good condition.

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## 2540. Chev. Michele Romeo, Catania, Italy.

## MUSCAT WINE.

*Report.*—A very well conditioned dessert wine, with the most delicious fine taste, and good quality; very cheap, and made of pure grapes.

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## 2541. Marquis Andrea Rondinelli-Vitelli, Florence, Italy.

## RED TABLE WINE.

*Report.*—An excellent table wine; of beautiful flavor, and in very good condition.

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## 2542. Prince Rospigliose Clemente, Florence, Italy.

## RED WINE.

*Report.*—A very superior red table wine; good quality, fine bouquet, and in a very excellent condition.

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## 2543. Platamone Brothers, Trapani, Italy.

## MARSALA WINE.

*Report.*—A very good Marsala wine, free of spirit, and of delicious bouquet; is of very good quality, and in good condition.

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## 2544. Cesare Paci, Florence, Italy.

## RED TABLE WINE.

*Report.*—A very good wine, and very cheap.

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## 2545. Baron Francesco Cantarella, Catania, Italy.

## RED TABLE WINE.

*Report.*—A very good and cheap wine; good bouquet, good quality, and in excellent condition.

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## 2546. G. B. Terranova, Commilleri, Vittoria, Syracuse, Italy.

## RED TABLE WINE.

*Report.*—A light table wine; of good flavor, cheap, and with pleasant bouquet.

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## 2547. Cesare Galli, Florence, Italy.

## RED TABLE WINE.

*Report.*—An excellent table wine; very cheap.

## REPORTS ON AWARDS.

## 2548. Giovanni Fracuzzi, Palermo, Italy.

## MARSALA WINE.

*Report.*—Very good Marsala wine; good quality, pure, fine bouquet, and in excellent condition, and cheap.

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## 2549. Ottaviani Brothers, Messina, Italy.

## DRY WHITE WINE.

*Report.*—Good table wine; perfectly kept; in good condition.

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## 2550. Jacobini Brothers, Genzano, Italy.

## RED TABLE WINE.

*Report.*—Very good old table wine, made wholly from grapes, and very cheap.

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## 2551. Duke d'Aumale, Palermo, Italy.

## WHITE WINE, CALLED ZUCCO.

*Report.*—A first-class dessert wine, with delicious flavor, very fine bouquet, and comparatively very cheap.

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## 2552. Baron Bettino Ricasoli, Florence, Italy.

## VARIETY OF WINES.

*Report.*—A very fine collection of the most exquisite wines, of aromatic fruit flavor; of very fine quality, delicious bouquet, and in very good condition.

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## 2553. T. Rouff, Naples, Italy.

## VARIETY OF WINES, RED AND WHITE.

*Report.*—A collection of rich wines, the most *recherché*; of superior quality, nice flavor, and kept in very good condition.

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## 2554. G. Luigi di Salvatore, Palermo, Italy.

## RED ALEATICO TABLE WINE.

*Report.*—An excellent sweet table wine; very palatable, and comparatively free from spirit or alcohol.

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## 2555. Baron Michele Bonanno, Syracuse, Italy.

## DESSERT WINE.

*Report.*—A remarkably good wine; of fine taste, and in very good condition.

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## 2556. Giacomo Facciotti, Gattinara, Italy.

## WINE.

*Report.*—One of the best wines in Italy; extremely pure, good quality, delicate bouquet, and in excellent condition.

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## 2557. Chev. Colomiatti, Avvocato, Chieri, Italy.

## BARBAROSSA WINE.

*Report.*—Good wine, of fine taste, and made with the greatest care.

**2558. Antonio Manzi, Naples, Italy.****WHITE SPARKLING WINE.**

*Report.*—Very good in every respect; fine quality, delicious bouquet, and in good condition.

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**2559. Chev. Domenico Ricci, Rome, for the Hospital of St. John at Laterano, Italy.****WINE.**

*Report.*—Well preserved; of good flavor; contains a very small percentage of alcohol, and is particularly used for convalescent patients.

---

**2560. Marquis Tanara, Bologna, Italy.****TABLE WINE AND DRY WHITE WINE.**

*Report.*—A very good brand of wine; prepared with the greatest care; of very fine quality and excellent good bouquet; one of the best Italian table wines. Also a very fine dry white wine, of good bouquet, and very cheap.

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**2561. Enological Society Veronese, Verona, Italy.****TABLE WINE AND DRY WHITE WINE.**

*Report.*—A thin table wine; very good, of fine bouquet, and well conditioned. It is specially recommended for exportation. The dry white wine is very good and cheap.

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**2562. Giuseppe Scala, Naples, Italy.****DRY WHITE LACRIMA CRISTI WINE AND CAPRI WINE.**

*Report.*—Very good and highly esteemed wine, and comparatively cheap. The red Capri wine is of very fine flavor, excellent quality, and in good condition; considered a splendid dessert wine.

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**2563. Pasquale Scala, Naples, Italy.****FALERNO WINE, WHITE LACRIMA CRISTI, AND CAPRI RED WINE.**

*Report.*—Very delicate wines; of delicious flavor, good bouquet, and in excellent condition. The Capri red wine is a very good and rich dessert wine, of fine quality, exquisite bouquet, and in excellent condition.

---

**2564. Marquis Spinola Brothers, Novi, Italy.****SHERRY WINE AND SWEET WINE.**

*Report.*—Very good sherry wine, equal in flavor, etc., to the most renowned Spanish sherry. Also sweet wine, eleven years old; made from pure, selected grapes; of very fine quality. This wine is of delicious bouquet, and in excellent condition.

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**2565. P. Cianfanelli, Leghorn, Italy.****CHIANTI WINE.**

*Report.*—Very good wine, of excellent quality, agreeable bouquet, and very well conditioned.

## 2566. Enological Society of Servigliano, Marche, Italy.

## RED TABLE WINE.

*Report.*—Very good table wine, which retains the taste peculiar to grapes of the locality where they were grown.

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## 2567. Ternavasio G. Russo, Brà, Italy.

## TABLE WINE.

*Report.*—A superior select table wine, of very fine quality, good bouquet, and in very good condition.

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## 2568. Francesco Savorini, Bologna, Italy.

## WHITE WINE AND CHAMPAGNE.

*Report.*—Excellent wine; carefully prepared, with fine bouquet, of good quality, and in excellent condition.

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## 2569. Giuseppe Giojuzza, Giobertini, &amp; Co., Palermo, Italy.

## MUSCAT WINE.

*Report.*—The best Italian dessert wine tasted; very fine flavor of the Muscatel grape; delicious bouquet, of very good quality, and prepared with great care.

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## 2570. Eugene Righetti, Modena, Italy.

## TABLE WINE.

*Report.*—Very good wine, of good quality, fine bouquet, and in excellent condition; ten years old, and very cheap.

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## 2571. Cav. Orazio Emanuel Fensi, Florence, Italy.

## WINE.

*Report.*—Of fair quality and good taste.

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## 2572. Rudolph Sneiderff, Tuscany, Italy.

## RED WINE.

*Report.*—A very good table wine, and very cheap.

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## 2573. Marquis Corsini Andrea Neri, Tuscany, Italy.

## RED WINE.

*Report.*—Very good table wine, of delicious bouquet, and in an excellent condition.

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## 2574. P. I. Valkenberg, Worms, Germany.

## WINES.

*Report.*—Commended for the clean, good taste, the condition, and pleasant flavor of the Liebfrauenmilch.

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## 2575. Henkell &amp; Co., Mentz, Germany.

## RHENISH WINES.

*Report.*—Commended for superior quality and style; also for the excellent making up of the sparkling Hocks.

**2576. Heinrich Diener, Hochheim, Germany.**

## RHENISH WINES.

*Report.*—The wine was found excellent in flavor, style, and richness.

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**2577. Nic. Burgeff, Geisenheim, Germany.**

## RHENISH WINES.

*Report.*—The flavor and style of the fine selected grape wines show careful culture of the Riesling grape.

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**2578. P. J. H. Brogsitter, Ahrweiler, Germany.**

## WINES.

*Report.*—Commended for the good quality, style, and elegance of the red wines produced on the Ahr.

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**2579. Jaeger & Son, Rüdesheim, Germany.**

## WINES.

*Report.*—A selected grape wine from the Scharlachberg was pronounced very striking and superior.

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**2580. I. A. Krass, Rüdesheim, Germany.**

## RHENISH WINES.

*Report.*—Commended for very good quality and flavor.

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**2581. Dilthey, Sahl, & Co., Rüdesheim, Germany.**

## RHENISH WINES.

*Report.*—The grand collection submitted contains noble specimens of fine wines from Rüdesheim, showing elegance, style, and good condition.

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**2582. Aug. Quitmann, Geisenheim, Germany.**

## RHENISH WINES.

*Report.*—The "Geisenheim Morsberg" was fully appreciated as a very superior fine Hock.

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**2583. J. Erhard, Rüdesheim, Germany.**

## RHENISH WINES.

*Report.*—Commended for the natural body, strength, and flavor of his selected grape wine from Rüdesheim.

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**2584. Joh. A. Jung, Assmannshausen, Germany.**

## RED RHENISH WINES.

*Report.*—The "Assmannshausen" shows all the characteristics of the finest red wine.

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**2585. Carl Erhardt, Rüdesheim, Germany.**

## RHENISH WINES.

*Report.*—The "Rüdesheimer Berg" was found a noble specimen of this growth, with all its fine characteristics.



## 2586. J. W. Meuschel, Sr., Buchbrunn, Germany.

## FRANCONIA WINES.

*Report.*—The Franconia wines exhibited show great delicacy in combination, with a natural body and strength, and are well made.

## 2587. Schmidt &amp; Kett, Eltville, Germany.

## RHENISH WINES.

*Report.*—Commended for good quality, body, and flavor.

## 2588. Gottlieb Müller, Winkel, Germany.

## RHENISH WINES.

*Report.*—Commended for good, genuine quality and striking flavor.

## 2589. Adolf H. Bach, Mayence, Germany.

## RHENISH WINES.

*Report.*—Commended for pleasant style and good condition.

## 2590. Echel Brothers, Deidesheim, Germany.

## PALATINATE WINES.

*Report.*—The wines show high culture and quality.

## 2591. Pet. Wittemann, Lorch, Germany.

## WINES.

*Report.*—The flavor and style of the wine show good and careful culture of the Riesling grape.

## 2592. Preusel &amp; Bachmann, Eltville, Germany.

## RHENISH WINES.

*Report.*—Commended for the good, noble style, in flavor and body, of the "'68 Markobrunner."

## 2593. Val Kindlinger, Neuendorf, near Eltville, Germany.

## RHENISH WINES.

*Report.*—Commended for elegant style and fine flavor.

## 2594. Aug. Rössler, Schloss Neuweier, Germany.

## WINES.

*Report.*—Commended for pleasant style, agreeable flavor, and good condition; proofs of good culture of vineyards and of good treatment of the wines.

## 2595. J. Langenbach &amp; Sons, Worms, Germany.

## WINES.

*Report.*—The Liebfrauenmilch is a grand wine. It was found perfect in every respect.

**2596. A. Nilkens, Eltville, Germany.**

RHENISH WINES.

*Report.*—Commended for elegance, quality, and good condition.**2597. Ed. Saarbach & Co., Mayence, Germany.**

WINE.

*Report.*—Commended for good quality.**2598. Ernst Peez Heirs, Oestrich, Germany.**

RHENISH WINE.

*Report.*—The wine was found very superior in flavor and full in body.**2599. Dahlen & Goedderitz, Lorch, Germany.**

WINES.

*Report.*—Commended for purity, elegance, and pleasant style.**2600. Frederick Altenkirch, Lorch, Germany.**

WINES.

*Report.*—The elegance and quality of the wines from Bodenthal found the fullest appreciation. Can only be produced with the best culture and care in vineyard and cellar.**2601. G. W. Siegfried, Rauenthal, Germany.**

RHENISH WINES.

*Report.*—The strikingly elegant quality of these wines was pronounced very superior.**2602. F. P. Buhl, L. A. Jordon, Deidesheim, & G. Schellhorn-Wallbillich, Forst, Germany.**

PALATINATE WINES.

*Report.*—The undoubted merits of the grand wines exhibited found the fullest appreciation, and gave a high idea of the excellent culture of the Palatinate vineyards.**2603. I. B. König Widow, Rauenthal, Germany.**

RHENISH WINES.

*Report.*—The "'62 Rauenthal Auslese" was found superior in quality and unsurpassed in bouquet.**2604. Schultz & Reuter, Rüdesheim, Germany.**

RHENISH WINES.

*Report.*—A "'61 Rüdeshheimer" selected grape wine found unanimous appreciation as one of the finest Hocks submitted.**2605. Wilhelm Zais, Wiesbaden, Germany.**

RHENISH WINES.

*Report.*—Commended for good quality.

**2606. H. I. Fendel, Lorch, Germany.**

## WINES.

*Report.*—The good quality of the wines exhibited proves the careful culture of the vines, and good treatment.

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**2607. J. Forst, Johannisberg, Germany.**

## RHENISH WINES.

*Report.*—Commended for elegant style and quality.

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**2608. Louis Feis, Deidesheim, Germany.**

## WINE.

*Report.*—Commended for good quality of his Palatinate wines.

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**2609. Fritz Lade, Geisenheim, Germany.**

## RHENISH WINES.

*Report.*—The wines were found perfect in body, flavor, and style.

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**2610. Fried. Seyler, Deidesheim, Germany.**

## PALATINATE WINES.

*Report.*—Commended for very superior quality, natural flavor, and body.

---

**2611. Winkel & Rothenbach, Rüdesheim, Germany.**

## RHENISH WINES.

*Report.*—Commended for elegant style and flavor.

---

**2612. B. Rosenstein, Wiesbaden, Germany.**

## RHENISH WINES.

*Report.*—Some of the samples showed all the qualities of grand Hocks of the best vintages.

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**2613. Franz Travers, Lorch, Germany.**

## WINES.

*Report.*—Commended for striking flavor and good style.

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**2614. Meyer & Coblenz, Bingen, Germany.**

## WINES.

*Report.*—The Scharlachberg wine was found full in body, possessing a striking flavor and the distinctiveness of a well-grown wine.

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**2615. Baron von Cunibert, Oestrich, Germany.**

## RHENISH WINES.

*Report.*—The wines were found excellent in every respect.

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**2616. G. C. Kesler & Co., Successor, Esslingen, Germany.**

## SPARKLING WINES.

*Report.*—The wines show good quality, and a happy combination of body and elegance.

**2617. F. Josef Lang, Würzburg, Germany.**

## SPARKLING WINE.

*Report.*—A red sparkling Franconia wine; was found very superior to the usual style of red sparkling wines.

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**2618. Hoehl Brothers, Geisenheim, Germany.**

## SPARKLING WINES.

*Report.*—The sparkling wines are well made; they show superiority of flavor and excellent constitution.

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**2619. Rhenish Sparkling Wine Co., Schierstein, Germany.**

## SPARKLING WINES.

*Report.*—A sparkling Johannisberg, showing the characteristics of good Rhine wine; well made up in a most pleasant sparkling wine. A champagne wine called "Rhinegold" was found delicate in style.

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**2620. Friedr. Kehrmann, Coblenz, Germany.**

## RHENISH SPARKLING WINES.

*Report.*—Commended for the good quality of the sparkling wines.

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**2621. Dietrich & Co., Rüdelsheim, Germany.**

## SPARKLING WINES.

*Report.*—The average quality of the samples submitted ranks high.

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**2622. J. M. Vornburger, Würzburg, Germany.**

## FRANCONIA SPARKLING WINES.

*Report.*—The wines show body and clean pleasant style, and are carefully prepared.

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**2623. J. Oppmann, Würzburg, Germany.**

## FRANCONIA SPARKLING WINES.

*Report.*—One of the samples was found the best Franconia sparkling wine submitted; full in body, superior in style and elegance.

---

**2624. Wilhelm Rasch, Oestrich, Germany.**

## RHENISH WINES.

*Report.*—Commended for high quality, body, and aromatic flavor.

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**2625. C. J. B. Steinheimer, Oestrich, Germany.**

## RHENISH WINES.

*Report.*—Commended for great delicacy and excellent quality in every respect.

---

**2626. Johann Klein, Johannisberg, Germany.**

## RHENISH WINES.

*Report.*—Commended for softness and elegance.

**2627. Prince Richard of Metternich-Winneberg, Johannisberg, Germany.**

RHENISH WINES.

*Report.*—The specimens exhibited of this excellent growth showed superior quality.**2628. Erwin Brück, Assmannshausen, Germany.**

RED WINES.

*Report.*—The "Assmannshauser" exhibited was found noble in flavor and full in body, and proves the careful culture of the vines.**2629. Jung & Co., Rüdesheim, Germany.**

RHENISH WINES.

*Report.*—Commended for the great delicacy and prominent flavor of their "'61 Rüdesheimer Berg Auslese."**2630. Rothe & Thorndike, Geisenheim, Germany.**

RHENISH WINES.

*Report.*—Commended for good quality.**2631. Labroise Brothers, Neustadt, Germany.**

PALATINATE WINES.

*Report.*—The wines show in a high degree the good quality of well-made Palatinate wines.**2632. Jacob Germersheimer, Lorch, Germany.**

WINES.

*Report.*—Commended for excellent quality and flavor, combined with moderate prices.**2633. Feist Brothers & Sons, Frankfort-on-the-Main, Germany.**

RHENISH STILL AND SPARKLING WINES.

*Report.*—The quality of the sparkling wines found the fullest appreciation, and could only be designated as excellent in every respect.**2634. Johann Michael Schary, Prague, Austria.**

AUSTRIAN FRUIT WINES.

*Report.*—Commended for the exquisite natural aroma of fruits shown by his fruit-wines.**2635. Franz A. Jálcs, Budapest, Austria.**

HUNGARIAN WINES.

*Report.*—Commended for the excellent quality of a collection of Hungarian wines.**2636. Franz Pokorny, Agram, Austria.**

AUSTRIAN WINES AND LIQUORS.

*Report.*—Commended for the excellent composition of his fruit brandies, which in a high degree show the natural flavor of the fruits from which they are distilled.

**2637. Transylvania Wine Association, Klausenburg, Transylvania, Austria.**

## AUSTRIAN WINES.

*Report.*—Commended for the great care taken in rational culture of the vines, as proved by the sound and good condition and fair quality of some of the samples.

---

**2638. Luigi Frizzi, Trento, Austria.**

## AUSTRIAN WINES.

*Report.*—Commended for the elegant wine of high aroma the exhibitor shows in his "Est Est Est."

---

**2639. Josef Ganz, Dornberg, Austria.**

## AUSTRIAN WINES.

*Report.*—Commended for good condition and high aroma.

---

**2640. August Schenkel, Lukaufen, Austria.**

## AUSTRIAN WINES.

*Report.*—The sample "'74 Jerusalemer" was distinguished by fragrance and elegant style.

---

**2641. A. Schwartzner's Successors, Vienna, Austria.**

## AUSTRIAN WINES.

*Report.*—Commended for a very noble and fine "'52 Tokay Ausbruch," and for the good condition of the wines exhibited.

---

**2642. F. Auchmann, Marburg, Styria, Austria.**

## STYRIAN CHAMPAGNE.

*Report.*—Commended for very superior quality and good flavor.

---

**2643. A. von Kriehuber, Marburg.**

## AUSTRIAN WINES.

*Report.*—Commended for good condition, delicacy, and body.

---

**2644. First Dalmatian Wine Co., Spalato, Austria.**

## AUSTRIAN WINES.

*Report.*—Commended for the good quality and fine natural flavor of the "vino di Spalato soprafino."

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**2645. Franz Perko, Marburg, Styria, Austria.**

## AUSTRIAN WINES.

*Report.*—Commended for very careful treatment and pleasant flavor.

---

**2646. J. Römer & Son, Vienna, Austria.**

## AUSTRIAN WINES.

*Report.*—A fine collection of elegant and well-flavored Austrian wines.

**2647. Dr. Othmar Reiser, Vienna, Austria.**

## AUSTRIAN WINES.

*Report.*—Commended for good quality.

---

**2648. G. Paulsen, Chillan, Chili.**

## WINES AND SPIRITS.

*Report.*—Commended for a variety of wines, of good promise, and spirits distilled from grapes, of a very commendable character.

---

**2649. N. Meneses, Rosa de los Andes, Chili.**

## WINES AND SPIRITS.

*Report.*—A fine, natural champagne, called Chicha, made without sugar and liquor, in splendid condition; and also for some spirits of wine, showing good bouquet and careful distillation.

---

**2650. B. Dupuch, Limaché, Chili.**

## WINES.

*Report.*—A collection of red wines, of six vintages, from 1870 to 1875, remarkable for good, sound condition, purity, fine taste, and careful culture. Also a well-flavored, sweet wine, white, of very agreeable taste.

---

**2651. Manuel Infante, Aconcagua, Chili.**

## WINES.

*Report.*—A number of samples of "Chicha," a fine, natural, sparkling wine of various vintages, in first-rate condition; cheap, for such a palatable wine.

---

**2652. Campora Brothers, Santiago, Chili.**

## WINES.

*Report.*—1. A well-fermented dry Muscatel, of a perfectly natural and fine flavor.  
 2. A natural champagne-like wine, called Chicha, of good quality.  
 3. A good wine from the Bordeaux grape.  
 4. Very sound, mild, palatable white wines, of good bouquet; of various vintages; especially remarkable, those of 1870 and 1872.

---

**2653. Francisco Rojas, Salamanca, Chili.**

## WINES.

*Report.*—A variety of good red and excellent white wines; well kept.

---

**2654. Jose Tomas de Urmenata, Limaché, Chili.**

## WINES.

*Report.*—A white dry wine, of excellent character and bouquet, and several vintages of claret (Bordeaux grape), of fine flavor, and in good condition.

---

**2655. R. Montané, Limaché, Chili.**

## WINES.

*Report.*—A claret of nice flavor and very light body; the best qualities of a good red table wine.

2656. Bardou Job, Paris, France.

CIGARETTE PAPER.

*Report.*—The cigarette paper, "Job's French Patent," is of the highest quality and beautifully arranged for use.

---

2657. Deener, Cissel, & Welch, Georgetown, D. C., U. S.

TWO VARIETIES OF FLOUR FROM WINTER WHEAT.

*Report.*—Color fine; strength very great; adapted for bread.

---

2658. Joaquim Carneiro Leão Queiroz, Pacos de Ferreira, Oporto, Portugal.

TWO SAMPLES OF CORN MEAL.

*Report.*—Commended for the following reasons:

1. Variety in fineness and color of the samples to suit the taste of customers.
  2. Soundness of the corn used in the manufacture.
- 

2659. Deener, Cissel, & Welch, Georgetown, D. C., U. S.

FLOUR FROM WINTER WHEAT.

*Report.*—Color fine; strength very great; adapted for general consumption.



## FLOUR AND MILLING MACHINERY.

### 2660. Edward P. Allis & Co., Milwaukee, Wis., U. S.

SEVERAL MILLING MACHINES; PAIR OF POLISHED CAST-IRON ROLLERS; A CYLINDER MILL.

*Report.*—*a.* Dounton's middlings purifier. Solidly built and adapted to high and low milling.

*b.* An Affleck's middlings purifier, well adapted to low milling.

*c.* A Rymal's millstone tryer, well adapted to intended use.

*d.* A portable run of stones.

All their articles are substantially made, and eminently well adapted to the uses contemplated.

It is the purpose of these hardened polished cylinders to grind the middlings produced in high milling.

The idea of the cylinders is excellent. These cylinders are of superb finish and substantial construction, and well adapted to the intended use.

### 2661. Ingraham & Beard, Chicago, Ill., U. S.

THREE SCOURERS, SMUTTERS, AND SEPARATORS COMBINED.

*Report.*—It is the purpose of this combination to purify the wheat by friction among the grains, and upon the roughened surfaces along which they are moved.

Adapted to its purpose, and, by the combination of the separator and scourer, economizes space.

### 2662. C. K. Bullock, Philadelphia, Pa., U. S.

OSCILLATING BED STONE BALANCE.

*Report.*—This machine is excellent in idea, novel, and the device suited to the end proposed.

### 2663. C. K. Bullock, Philadelphia, Pa., U. S.

FLOUR PACKER.

*Report.*—This machine is admirably suited to the purpose intended, and easy to manipulate.

### 2664. C. K. Bullock, Philadelphia, Pa., U. S.

MIDDINGS PURIFIER.

*Report.*—This machine is called the "Garden City purifier." Well adapted to its purpose in low milling.

### 2665. Howes, Babcock, & Co., Silver Creek, N. Y., U. S.

EUREKA BRUSH POLISHING MACHINE.

*Report.*—It is the purpose of this machine to free the wheat from all portions not containing flour, and to finish with the aid of beaters and brushes.

Solidly built, and abrades the wheat to any desired degree.

**2666. Throops Grain Cleaner Co., Auburn, N. Y., U. S.**

GRAIN SCOURER, SMUTTER, AND SEPARATOR; ALSO WHEAT BRUSH AND FINISHING MACHINE.

*Report.*—*a.* Grain scourer, smutter, and separator,—solid, compact, and easily adjustable.  
*b.* Wheat brush and finishing machine, a vertical cylinder covered with tampico brush, revolving in a horizontally corrugated, adjustable sheet-iron mantle. Adapted to remove to any desired degree the outer coats of the wheat, easily adjustable, simple, and adapted to the purpose intended.

---

**2667. Blake & Walton, Philadelphia, Pa., U. S.**

BRUSH WITH ANTI-FRICTION ROLLERS.

*Report.*—The rollers are of vulcanized fibre; the idea is good and adapted to prevent the abrasion of the mill spindle.

---

**2668. Baltimore Pearl Hominy Co., Baltimore, Md., U. S.**

CORN HULLING AND HOMINY MILL.

*Report.*—A mill for the removal of the outer coats of the grain of Indian corn and the preparation of hominy.

Commended for compactness, excellence of product, and capacity of production.

---

**2669. Barnard & Leas Manufacturing Co., Moline, Ill., U. S.**

A MACHINE FOR PACKING FLOUR.

*Report.*—Commended as convenient to work, and adapted to use intended.

---

**2670. Howes, Babcock, & Co., Silver Creek, N. Y., U. S.**

EUREKA SMUT AND SEPARATING MACHINE.

*Report.*—It is the purpose of this machine to free the wheat from dust through the action of wing beaters.

It is simple, but little exposed to abrasion, and adapted to its purpose.

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**2671. John T. Noye & Son, Buffalo, N. Y., U. S.**

PORTABLE FLOURING AND GRIST MILLS.

*Report.*—Commended for simplicity, compactness, and solidity.

---

**2672. Huntley, Holcomb & Hine, New York, N. Y., U. S.**

A MIDDINGS PURIFIER; ALSO THREE BRAN DUSTERS.

*Report.*—They are easy to handle, and adapted to the purpose intended.

---

**2673. John T. Noye & Son, Buffalo, N. Y., U. S.**

WORKING MODEL OF A FLOURING MILL.

*Report.*—A model of sixteen run of stone, in the low milling system, complete in all its details, including separators, smut machines, millstones, elevators, bolts, middlings purifiers, bran dusters; every part in working order, and running connections made, set up, and put in operation by Robert H. Fenwick, millwright.

Commended for its completeness of illustration, and the intelligence and skill with which all its details have been carried out.

**2674. Edward Harrison, New Haven, Conn., U. S.**

A PORTABLE VERTICAL RUN OF STONES.

*Report.*—Commended for solidity and good workmanship, economy and adaptability.**2675. Munson Brothers, Utica, N. Y., U. S.**

PORTABLE MILL.

*Report.*—Commended as solidly made and adapted to its purpose. Mill spindle well arranged for lubrication.**2676. D. M. Richardson, Detroit, Mich., U. S.**

PATENT WHEAT POLISHER, SCOURER, AND SEPARATOR.

*Report.*—Object to purify the wheat by repeated beating and friction of the grains. The machines are solid, substantially made, and well suited to the purpose intended.**2677. M. Deal & Co., Bucyrus, Ohio, U. S.**

IMPROVED CALIFORNIA SMUTTER AND SEPARATOR COMBINED.

*Report.*—Is simple, compact, and adapted to the purpose intended, especially for manipulating large stores of wheat.**2678. Eureka Manufacturing Co., Rock Falls, Ill., U. S.**

BECKER WHEAT BRUSH.

*Report.*—This machine purifies wheat with a vertical cone completely covered with brushes within a conical shield.

It is easy to regulate, substantial and compact in construction.

**2679. Turner, Parks, & Co., Cuyahoga Falls, Ohio, U. S.**

MIDDLINGS PURIFIER; ALSO SEPARATOR AND SCOURER COMBINED.

*Report.*—Middlings purifier. Plan good for low milling. Well adapted for use. Separator and scourer combined. Adapted to purpose intended.**2680. Harris Brothers, Elizabeth, N. J., U. S.**

SMUT AND SCOURING MACHINE.

*Report.*—Designed to purify the wheat with a conical and vertical stone through friction, impact, and play of the centrifugal force. The idea is good, the machine simple and adapted to use.**2681. Charles Kästner & Co., Chicago, Ill., U. S.**

TWO PORTABLE GRIST AND FEED MILLS.

*Report.*—Commended as easy to handle, and well constructed.**2682. U. S. Wind Engine and Pump Co., Batavia, Ill., U. S.**

MODEL OF A COMPLETE WIND GRIST MILL WITH THREE RUNS OF STONE.

*Report.*—Fulfills its purpose of illustration, and is admirably constructed.

**2683. Barnard & Leas Manufacturing Co., Moline, Ill., U. S.****BRUSH SCOURING MACHINES.**

*Report.*—Commended as adapted to purify and point the wheat by means of conical brush plates, taking advantage of the centrifugal force. The idea is new and good, in accordance with the principles of perfect purification.

---

**2684. Roland, Francis, & Co., Reading, Pa., U. S.****KEYSTONE GRAIN DECORTICATOR AND SEPARATOR, WHOLLY OF IRON.**

*Report.*—It consists of a horizontal disk covered with a steel brush, and a lower disk of cast iron, presenting a surface of a continuous spiral trough.

The idea is good; the machine is solid and lasting, and adapted to the purpose intended.

---

**2685. Blake & Walton, Philadelphia, Pa., U. S.****FLOUR-MILL BOLT AND FIXTURES.**

*Report.*—The upper part of the interior of the drum is covered with wire brushes to detach the flour from the bran. Adapted to the purpose intended.

---

**2686. Herbert S. Jewell, Brooklyn, N. Y., U. S.****SEPARATOR.**

*Report.*—Commended for solid and superb workmanship, specially to be commended for the adjustability of the screens according to the relative proportions of wheat and oats, or other impurities.

---

**2687. Leonard & Silliman, Bridgeport, Conn., U. S.****MILLS FOR CORN AND OTHER GRAIN.**

*Report.*—Commended for economy of cost and operation, and adaptability to the various purposes for which it is intended, and for superior arrangement for lubrication of spindles.

---

**2688. J. S. Sutcliffe, Bacup, Lancashire, England.****MIDDLINGS PURIFIER.**

*Report.*—The machine works well, and the constant cleaning of the sieves by means of automatic brushes is efficient and specially to be commended.

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**2689. J. Pernollet, Paris, France.****SIX GRADING MACHINES FOR WHEAT.**

*Report.*—Gradation is accomplished in cylinders; commended as simple and good.

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**2690. Mayer & Co., Kalk-on-the-Rhine, Germany.****FIVE GRADING MACHINES.**

*Report.*—The gradation is effected by means of revolving cylinders. Commended as well adapted to the purpose intended.

**2691. Joacks & Behrns, Lübeck, Germany.**

## IMPROVED FLOURING-MILL STONES.

*Report.*—High pressure applied to mill stones for preventing loss of flour, dust, and explosions, and for cooling the product in low milling, by conducting a current of air through the eye of the upper stone and out between the stones. Above is a series of folds of flannel to catch the dust.

Commended as exceedingly well adapted to the purpose intended.

---

**2692. L. Dassonville de St. Hubert, Namur, Belgium.**

## LARGE BURR STONES, DRESSED AND UNDRESSED.

*Report.*—Commended as of superior quality, large size, and in solid blocks.

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**2693. Heidegger, Wegmann, & Co., Zurich, Switzerland.**

## SILK BOLTING CLOTHS.

*Report.*—A great variety of grades and excellence of fabric of silk bolting cloths.

---

**2694. Egli & Sennhauser, Zurich, Switzerland.**

## SILK BOLTING CLOTHS.

*Report.*—The exhibit includes forty-nine grades of bolting cloths. Commended for variety and excellence of fabric.

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**2695. Dufour & Co., Thal, St. Gallen, Switzerland.**

## SILK BOLTING CLOTH.

*Report.*—Commended for the large variety and perfection of fabric in the bolting cloths exhibited.

## SIGNING JUDGES OF GROUP IV.

The figures annexed to the names of the Judges indicate the reports written by them respectively.

W. C. KERR, 1, 2, 3, 4, 5, 6, 7, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 31, 32, 33, 34, 35, 36, 419, 420, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1044, 1045, 1046, 1047, 1048, 1050, 1051, 1052, 1053, 1071, 1075, 1076, 1077, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1092, 1093, 1094, 1095, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1142, 1143, 1144, 1146, 1256.

G. F. SECCHI DE CASALI, 8, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 375, 376, 377, 378, 379, 380, 395, 429, 443, 444, 445, 446, 447, 448, 449, 450, 451, 455, 456, 460, 461, 462, 463, 464, 465, 466, 467, 480, 505, 518, 519, 542, 593, 594, 712, 1139, 1140, 1141, 1170, 1171, 1172, 1174, 1195, 1204, 1210, 1211, 1216, 1217, 1218, 1243, 1244, 1255, 1343, 1361, 1363, 1369, 1389, 1390, 1391, 1392, 1413, 1432, 1436, 1444, 1483, 1484, 1485, 1486, 1487, 1489, 1490, 1491, 1492, 1493, 1495, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1517, 1518, 1519, 1520, 1521, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1534, 1535, 1536, 1539, 1540, 1541, 1542, 1676, 1678, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1720, 1721, 1722, 1723, 1724, 1726, 1744, 1798, 1799, 1800, 1801, 1840, 1861, 1953, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2568, 2469, 2470, 2471, 2472, 2473, 2474, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573.

E. H. VON BAUMHAUER, 9, 10, 11, 12, 408, 457, 503, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 733, 734, 735, 736, 737, 738, 739, 740, 903, 904, 1247, 1248, 1364, 1445, 1459, 1460, 1564.

RYLAND T. BROWN, 28, 74, 75, 93, 108, 109, 110, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 193, 199, 203, 223, 364, 365, 367, 403, 404, 418, 422, 423, 424, 425, 426, 427, 428, 670, 876, 1033, 1175, 1176, 1177, 1178, 1179, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1196, 1197, 1198, 1199, 1201, 1202, 1203, 1212, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1245, 1246, 1249, 1250, 1251, 1284, 1330, 1331, 1332, 1333, 1334, 1335, 1358, 2658.

TH. SEGELCKE, 29, 30, 127, 671, 672, 673, 674, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 707, 708, 709, 710, 711, 713, 714, 715,

716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 732, 907, 952, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1028, 1029, 1030, 1031, 1032, 1359, 1499.

NICOLAU J. MOREIRA, 37, 38, 39, 40, 190, 402, 440, 442, 499, 504, 507, 508, 509, 512, 546, 547, 548, 552, 553, 554, 555, 556, 563, 564, 565, 566, 567, 568, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 667, 668, 669, 877, 1338, 1339.

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WALTER S. GREENE, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 128, 129, 130, 131, 132, 198, 758, 766, 769, 770, 771, 772, 773, 784, 785, 786, 798, 799, 801, 803, 814, 815, 817, 818, 819, 820, 821, 822, 823, 825, 836, 847, 856, 857, 858, 861, 1743, 2005, 2657, 2659.

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J. D. IMBODEN, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 759, 760, 761, 762, 763, 764, 765, 767, 768, 774, 782, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 800, 802, 816, 824, 840, 841, 842, 843, 844, 845, 846, 848, 849, 850, 851, 852, 853, 854, 864, 1323, 1324, 1325, 1326, 1327, 1328, 1351, 2656.

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JUAN MORPHY, 1078, 1412, 1862, 1867, 1868, 1869, 1877, 1878, 1879, 1880, 1881, 1882, 1886, 1947, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1975, 1976, 1977, 1978, 1979, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2007.

SUPPLEMENT TO GROUP IV.

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REPORTS  
OF  
JUDGES ON APPEALS.

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JUDGES.

JOHN FRITZ, Bethlehem, Pa.  
EDWARD CONLEY, Cincinnati, Ohio.  
CHARLES STAPLES, JR., Portland, Me.  
BENJ. F. BRITTON, New York City.  
H. H. SMITH, Philadelphia, Pa.

COLEMAN SELLERS, Philadelphia, Pa.  
JAMES L. CLAGHORN, Philadelphia, Pa.  
HENRY K. OLIVER, Salem, Mass.  
M. WILKINS, Harrisburg, Oregon.  
S. F. BAIRD, Washington, D. C.

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1. Henry Maillard, New York, N. Y., U. S.

DRAGÉES.

*Report.*—Dragées of a great variety of forms and flavors, showing superiority in quality and artistic shapes.

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2. Napoleon Dubrul, Cincinnati, Ohio, U. S.

METALLIC CIGAR MOULDS.

*Report.*—Commended for utility and adaptation to purpose intended.

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3. I. Landsberger & Co., San Francisco, Cal., U. S.

CALIFORNIA CHAMPAGNE FROM NATIVE GRAPE.

*Report.*—Commended for progress in the manufacture of champagnes.

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4. Edward Heaton, New Haven, Conn., U. S.

MEDICINAL FOOD—"IMPERIAL GRANUM."

*Report.*—Commended for utility and adaptation to purpose intended.

---

5. R. C. Kinney & Sons, Salem, Oregon, U. S.

FLOUR.

*Report.*—Commended for excellent quality and fitness for shipment to other climates.

**6. Charles G. Am Ende, Hoboken, N. J., U. S.**

SALT FOR PRESERVATION OF ANIMAL SUBSTANCES.

*Report.*—Commended for a cheap and simple method of preserving raw and cooked meats without canning.

**7. New York Desiccating Co., New York, N. Y., U. S.**

DESICCATED COCOANUT.

*Report.*—Commended for a preparation of cocoanut that has stood the heat of summer, and after soaking is fresh and fit for the trade purposes for which it is intended.

**8. Henry C. Blair's Sons, Philadelphia, Pa., U. S.**

PREPARED WHEAT FOOD, AND PHARMACEUTICAL PREPARATIONS.

*Report.*—Commended for utility, quality, and fitness for purpose intended.

**9. H. A. Chalvin & Co., New York, N. Y., U. S.**

LIQUEURS OR CORDIALS, AND BRANDIED FRUITS.

*Report.*—Commended for an extended exhibit of steam distilling apparatus, herbs, plants, and seeds, bottles, panniers, and rattan covers, all prepared in the United States, for the manufacture and dispensing of every variety of cordial as well as brandied fruits. These cordials possess fine flavor, strength, and purity, showing marked skill and ability in their preparation, fully equaling the imported articles in beauty and quality.

**10. Swallow & Ariell, Victoria, Australia.**

BISCUITS.

*Report.*—Commended for variety and good quality.

**11. Theodore Meinhard & Son, Venezuela.**

ANGOSTURA BITTERS.

*Report.*—Commended for purity and genuineness of compound.

**12. Juan José Barrinso Lopez, La Victoria, Canary Islands.**

MALVASIA WINE.

*Report.*—Commended for good quality and flavor.

**13. Giuseppe Cantanzaro, Palermo, Sicily, Italy.**

LICORICE.

*Report.*—Commended for good quality.

**14. Cesare Fantozzi, Foligno, Italy.**

LIQUORI DE QUATTRO FRATELLI.

*Report.*—Commended for liquors or cordials of good quality.

**15. Baron A. Porcari, Palermo, Italy.**

GRAIN, OLIVE OIL, AND PRESERVED AND FRESH FRUIT.

*Report.*—A fine exhibit of olive oil, preserved fruits, grain, and wine, of excellent quality, the product of his farm.

## 16. Brenna Santo, Como, Italy.

ELIXIR VOLTA.

*Report.*—Commended for good quality.

## 17. Vitiello &amp; Torrese, Torre del Greco, Italy.

WHITE AND RED WINES.

*Report.*—Wines of Italy, of good quality.

## 18. Pietro Giaccone, Palermo, Italy.

MARSALA WINE.

*Report.*—Commended for excellent quality.

## 19. Liccioli Filippo &amp; Brother, Florence, Italy.

RED AND WHITE WINES.

*Report.*—Commended for good quality.

## 20. Pietro Ruffini, Florence, Italy.

CORDIALS.

*Report.*—Commended for good quality.

## 21. Luigi Cillario, Bologna, Italy.

VERMOUTH BITTERS (WORMWOOD).

*Report.*—Commended for good quality as bitters of wormwood.

## 22. Rufus Usher, Bodicote, Oxfordshire, England.

RHUBARB.

*Report.*—Commended for success in cultivating rhubarb for medicinal purposes, and creating a quality that compares favorably with the best roots.

## 23. Thomas Smith &amp; Co., London, England.

ORNAMENTAL CONFECTIONERY.

*Report.*—Commended for a superior and fine collection of gum paste vases, bouquets, wreaths, and ornaments for wedding cakes, very nicely worked. Great and elegant variety of costume mottoes.

## 24. Gerber &amp; Co., Thun, Switzerland.

CONDENSED MILK.

*Report.*—Commended for good quality and utility.

## 25. Delchevalerie, Egypt.

VARIOUS SEEDS, DRIED FRUITS, AND GARDEN PRODUCTS.

*Report.*—A fine exhibit, well arranged, and showing great care in the variety of the collection.

## 26. Hivert, Pellevoisin, &amp; Godet, La Rochelle, France.

## LA ROCHELLE BRANDY.

*Report.*—It is of three vintages,—one fifteen, one ten, and one six years old. It is employed to flavor “high wines” and other liquors, and not for drinking alone. Commended for quality and fitness for purpose intended.

## 27. Dr. J. G. B. Siegert &amp; Sons, Port Spain, Trinidad.

## ANGOSTURA BITTERS.

*Report.*—Commended for purity and genuineness of compound.

## 28. T. K. Bennett, Victoria, Australia.

## PRESERVED MEATS.

*Report.*—Commended for good quality and flavor; well preserved and well canned.

## 29. Alexander McPherson, Brisbane, Queensland.

## AUSTRALIAN FIBRES.

*Report.*—Commended for an interesting exhibit of various kinds, among which the *Sida Retusa* may be specially mentioned for its properties resembling hemp.

## 30. W. H. Hayes, Queensland.

## CANDIED AUSTRALIAN FRUITS.

*Report.*—Commended for good quality, having stood the test of a hot summer, unchanged.

## 31. Poole &amp; Hunt, Baltimore, Md., U. S.

## MACHINE FOR MIXING CONSTITUENTS OF ARTIFICIAL FERTILIZER.

*Report.*—Commended for satisfactory adaptation to the purpose intended.

## 32. J. E. Hetherington, Cherry Valley, N. Y., U. S.

## HONEY AND WAX.

*Report.*—Commended for a beautiful display of honey-combs and samples of honey of excellent color and taste, as well as for a large display of wax of superior quality; also for a very superior style of package, patented 18th of July, 1876, specially adapted for the necessities of production, as shown by the exceedingly well filled combs. Mr. J. E. Hetherington's apiary is probably one of the largest in the United States, having sold during the running year over 76,000 pounds of honey.

## SIGNING JUDGES OF SUPPLEMENT TO GROUP IV.

The figures annexed to the names of the Judges indicate the reports written by them respectively.

HENRY H. SMITH, 1, 2, 3, 4, 5, 7, 8, 9, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 30, 31.

SPENCER F. BAIRD, 6, 11, 27.

COLEMAN SELLERS, 10, 12, 23, 28.

B. F. BRITTON, 29.

E. OLDENDORFF, 32.

## GROUP V.

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FISH AND FISHING PRODUCTS, APPARATUS OF  
FISHING, ETC.

## GROUP V.

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### JUDGES.

#### AMERICAN.

SPENCER F. BAIRD, Smithsonian Institution, Washington, D. C.

T. B. FERGUSON, Baltimore, Md.

#### FOREIGN.

JOAKIM ANDERSEN, Norway.

## GROUP V.

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### FISH AND FISH PRODUCTS—APPARATUS OF FISHING, ETC.

CLASS 640.—Marine mammals,—seals, cetaceans, etc., specimens living in aquaria, or stuffed, salted, or otherwise preserved.

CLASS 641.—Fishes, living or preserved.

CLASS 642.—Pickled fish, and parts of fish used for food.

CLASS 643.—Crustaceans, echinoderms, bêche-de-mer.

CLASS 644.—Mollusks, oysters, clams, etc., used for food.

CLASS 645.—Shells, corals, and pearls.

CLASS 646.—Whalebone, shagreen, fish-glue, isinglass, sounds.

CLASS 647.—Instruments and apparatus of fishing,—nets, baskets, hooks, and other apparatus used in catching fish.

CLASS 648.—Fish culture,—aquaria, hatching pools, vessels for transporting roe and spawn, and other apparatus used in fish breeding, culture, or preservation.





# GENERAL REPORT

OF THE

## JUDGES OF GROUP V.

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INTERNATIONAL EXHIBITION,  
Philadelphia, 1876.

PROF. FRANCIS A. WALKER, *Chief of Bureau of Awards:*

SIR,—I have the honor to transmit to you, on behalf of the Judges of Group V., the general report upon "Fish and Fishing Products, Apparatus of Fishing," etc.

Very respectfully,  
B. PHILLIPS.

## GROUP V.

### FISH AND FISHING PRODUCTS APPARATUS OF FISHING, ETC.

BY B. PHILLIPS.

At the International Exhibition exhibits of fish and fish-products, apparatus used in catching fish and for fish-culture, etc., occupied a prominent position.

In 1866, a special exhibition of fisheries was held at Boulogne-sur-Mer, under the auspices of the French Government, which was called l'Exposition Internationale de Pêche de Boulogne-sur-Mer. But as the exhibits were mainly derived from France, opportunities of comparing fish-products, or of studying the apparatus used in the capture of fish, coming from other countries, were limited. It may be stated, that on no other occasion have such facilities been afforded as at the International Exhibition of 1876 to contrast the fish-products of various countries, nor at any other time has there been assembled such a variety of fishing apparatus.

The following countries, represented at Philadelphia, had exhibits included in Group V.: Austria, Argentine Republic, Bahamas, Bermuda, Brazil, British Columbia, Canada, China, Chili, Cape of Good Hope, England, France, Germany, Italy, Japan, Liberia, Netherlands, New South Wales, Norway, Portugal, Russia, Sweden, Spain, Turkey, Tasmania, and the United States. The vast importance of fish as food, the amount of capital employed in the fisheries, the attention paid to the subject in other countries, and the conspicuous position occupied by fish-culture, were thoroughly demonstrated at the International Exhibition.

In treating of the great variety of objects included under the general head of Group V., for purposes of distinction, and a more thorough study of the subject, nine classes or subdivisions were made, as stated on page vii.

CLASS 640.—MARINE MAMMALS—SEALS, CETACEANS, ETC., SPECIMENS LIVING IN AQUARIA, OR STUFFED, SALTED, OR OTHERWISE PRESERVED.

In this class, the display of stuffed seals from the Atlantic and Pacific coast, exhibited by the Smithsonian Institution, was remarkable for its variety. The importance of the Phocidæ, and their rapid diminution on the Atlantic coast, have directed the attention of the Government, and of students of natural history, a more particular inquiry into the habits of the seal. The Smithsonian Institution presented for examination in the Government Building all the known American varieties of the Phocidæ, carefully stuffed, such specimens being excellent as to preparation. Of parts of Cetaceans, the jaws of right and sperm whales, with crude whalebone, were exhibited by the Smithsonian Institution, together with some plaster models of the smaller varieties of the Cetaceans. The character of the buildings which served for the exhibition precluded the placing of live seals in aquaria.

CLASS 641.—FISHES, LIVING OR PRESERVED.

To this class photographs, drawings, plaster of Paris and papier-maché casts, or models, of fish were added. This class, made more especially for the purpose of study, was very fully represented in some of its subdivisions. The preparations made by the Centennial Commissioners, however, were not of a character to insure a successful exhibition of fish in aquaria. The methods employed to maintain fish alive in their natural element were not fully carried out at the period of the Exhibition. It is, however, quite evident that peculiar and special aquaria would have had to be erected for the purpose of keeping fish alive. The expense of constructing such aquaria, and the restricted time of the Exhibition, precluded the successful carrying out of this enterprise. In Agricultural Hall were placed several large aquaria, and a number of smaller ones. The aerating engine was faulty in construction, insufficient in size, often breaking down, and depriving the water of the necessary quantity of air. Such apparatus as was employed during an unusually hot summer to reduce the temperature of the water was defective, and inadequate for refrigerating purposes. During the summer many fish died, and it was a difficult task to keep them alive at all. Such accidents as occurred to the fish were attributable to the defects before mentioned, and were beyond the control of Mr. Frederick Mather, the superintendent of the aquaria.

The following fresh-water fish were placed in the aquaria :

#### FRESH-WATER FISH.

Black bass, <i>Micropterus nigricans</i> .	Grayling, <i>Thymallus tricolor</i> .
Large-mouthed black bass, <i>Micropterus Floridanus</i> .	Shad, <i>Alosa sapidissima</i> .
Brook-trout, <i>Salmo fontinalis</i> .	Lake trout, <i>Salmo conifinis</i> .
Buffalo-fish, <i>Bubalichthys bubalus</i> .	Sunfish, <i>Pomotis aureus</i> , <i>Pomotis auritus</i> .
Catfish, <i>Amiurus catus</i> , <i>A. nigricans</i> , <i>Ictalurus cærulescens</i> .	Bream, <i>Calliurus</i> .
Chubs, <i>Semotilus corporalis</i> .	Yellow perch, <i>Perca flavescens</i> .
Eels, <i>Anguilla Bostoniensis</i> .	Pickereel, <i>Esox reticulatus</i> , <i>E. fasciatus</i> .
	Suckers, <i>Catostomus teres</i> .

With the salt-water fish placed in the aquaria the experiment was hardly more successful, the fish living but a short time, from want of sufficient aeration and from too high temperatures. Of sea-fish and crustaceans, etc., common to our own waters, the following were placed in the salt-water aquaria :

#### SALT-WATER FISH.

Sheepshead, <i>Archosargus probatocephalus</i> .	King-crabs, <i>Polyphemus occidentalis</i> .
Toad-fish, <i>Batrachus tau</i> .	Hermit-crabs, <i>Pagurus pollicardus</i> .
File-fish, <i>Ceratacanthus aurantiacus</i> .	Sand-crabs, <i>Platycarcinus inoratus</i> .
Tautog, <i>Tautoga onitis</i> .	Blue-crabs, <i>Lupa dicantha</i> .
Sharp-nosed skates, <i>Raia levis</i> .	Fiddlers, <i>Gelsimus vocans</i> .
Smooth dog-fish, <i>Mustela canis</i> .	Sea-spiders, <i>Libinia canaliculata</i> .
Flounder, <i>Chanopsetta ocellaris</i> .	Diamond-back terrapin, <i>Emys palustris</i> .
Pipe-fish, <i>Syngnathus Peckianus</i> .	Loggerhead turtle.
Sting-ray, <i>Trygon centrura</i> .	Green turtle.
Sea-robin, <i>Prionotus evolans</i> .	Lobsters.
Cunner, <i>Tautoglabrus adspersus</i> .	

Coming from the Commissioner of Bermuda, the following fish peculiar to the waters of Bermuda were put in the aquaria, but owing to the causes before mentioned, these foreign fish speedily died :

Squirrels, <i>Holocentrum sogo</i> .	Hinds, <i>Epinephelus guttatus</i> .
Bream, <i>Pimelepterus boscii</i> .	Groupers, <i>Epinephelus oxypterus</i> .
Grunts, <i>Hæmulon</i> . (?)	Sergeant-majors, <i>Glyphidodon saxatilis</i> .
Gray snapper, <i>Lutjanus caxis</i> .	Doctor, <i>Acanthurus chirurgus</i> .

In the refrigerating apparatus employed for keeping fish, the exhibit was a remarkable one. No less than seventy-four distinct species of fish were placed in refrigerators in the Government Building, and, in most cases, as of edible fish, as many as ten of the same kinds of fish, from different localities, were presented for examination. The following fish were exhibited by Mr. Eugene G. Blackford, of New York, in the refrigerators :

Tarpum.	Mackerel, peculiar.	Blue-fish.
Wolf-fish.	Flounders.	Rock cod.
Sharks.	Fluke.	Shad, North Carolina.
Monster blackfish, 22½ lbs.	Halibut.	Shad, New York.
Fresh-water sheepshead.	Sole.	Shad, Pennsylvania.
Wall-eyed pike.	Catfish.	Frogs.
Moss-bunker.	Paddle-fish.	Rabbit-fish.
Yellow perch.	Graylings.	Lobsters.
Butler-fish.	White perch.	Weak-fish.
Herring.	Squid.	Silver garfish.
Sea-robin.	Skates.	White-fish.
Porgies.	Bass.	Frost-fish.
King-fish.	Sea-bass.	Eels.
Ceres.	Mussels.	Turbot.
Lump-fish.	Clams.	Pickrel.
Sturgeons.	Brook-trout.	Black bass.
Salmon-trout.	Salmon, Kennebec.	Sunfish.
Red snapper.	Salmon, Restigouche.	Buffalo-fish.
Spotted grouper.	Salmon, California.	Lafayette-fish.
Grouper.	Sheepshead.	Smelts.
Crevalle.	Cod.	Green turtle.
Pompanos.	Haddock.	Terrapins.
Moon-fish.	Pollock.	Horse-shoe crabs.
Fresh mackerel.	Cusk.	Loggerhead turtle.
Spanish mackerel.		

Such of these fish as were in ordinary use as food were remarkable for their size and beauty, and demonstrated the great abundance and variety of fish-food which the lakes, rivers, and seas of the United States possess.

In preparations of fish preserved in alcohol, the exhibits furnished by the Museum of Bergen (Norway) were distinguished for excellence and variety. One peculiar trait of this collection was an exhibit of the sea-fish in ordinary use as food in their various stages of development. Several collections made by Sweden and Canada, and one by the Maryland State Commission, were of a comprehensive character. The Maryland collection was thought worthy of special mention, as containing almost all the varieties of fish caught in Chesapeake Bay.

In stuffed fish, such collections as were on exhibition were not remarkable. It seems quite evident that while the taxidermist is enabled to retain, in some degree, the proportions of the animal or bird to be stuffed, and may keep the color of the fur or plumage, fish subjected to the same methods do not preserve either their form or peculiar coloring. In a certain time, longer or shorter, stuffed fish exude a peculiar oil, which destroys their natural color; shrinkage also takes place, and the scales gradually drop off of even the most carefully preserved specimens.

The collection of plaster casts of fish, included in Class 641, shown by the Smithsonian Institution, was by far the largest and most perfect ever exhibited. These casts, modeled from actual fish, cannot be otherwise than truthful as to form. As the hues and colors, spots and stripes, of the fish were carefully copied, the peculiar appearance of each species of fish could be unhesitatingly recognized. It occurred quite frequently during the period of the International Exhibition that this collection of plaster casts of fish had to be studied. In some special cases, when preparations of fish used as food (Class 642) could not be determined as to the kind of fish, visitors from other countries often ascertained the species by consulting these plaster casts. It became quite interesting to bring Chinese and Japanese into the Smithsonian collection of plaster casts, and to notice them recognizing certain kinds of fish as common in their country, while other fish were strange and unfamiliar to them.

The series of photographs of American fish exhibited by the Smithsonian Institution, each having a scale giving a fixed standard in feet and inches, must be considered as a great help to the study of ichthyology. This method of imparting information is so simple, first by means of plaster casts, and supplementing these casts with the photographs of the same fish, that it is believed to be the best yet devised. If for certain details fish kept in alcohol may still find a place in museums, it is thought that, for all general purposes, the casts and photographs present great advantages over dried or stuffed fish. Scientific representatives of other countries present at the International Exhibition were loud in their praises of the American manner of depicting fish, and were anxious to learn the method of making plaster casts, and to obtain duplicate specimens.

Very accurate drawings of fish, carefully colored, coming from the Cambridge Museum, of Massachusetts, and from the Smithsonian Institution, were found in Class 641.

The progress made then in this peculiar branch, to wit: the methods to be employed to facilitate the study of ichthyology, by means of casts and photographs of fish, it is thought has been very great.

Some attention had been directed towards changing the shapes of the glass vessels in which fish were placed in alcohol, with a view of preventing a certain distortion of form, due to the irregular magnifying power of spherical glass vessels. In the collection of fish exhibited by the Maryland Fish Commission, such specimens had been placed in square glasses. It is true, distortion of the fish was, in a measure, prevented. The fragility of the glass vessels, however, and

the difficulty of fitting square corks into the openings of the vessels, it was thought, were objections which more than counterbalanced the imperfections of distortions due to round glass vessels.

#### CLASS 642.—PICKLED FISH, AND PARTS OF FISH USED FOR FOOD.

This class was very fully represented, there being some three hundred preparations of fish used for food sent to the Exhibition, coming from many parts of the world. The following fish, arranged in an endless variety of methods, were in use :

Anchovies.	Hake.	Ox-fish.	Shark.
Bream.	Haddock.	Oolachans.	Skate.
Barbel.	Halibut.	Pilchard.	Sprat.
Caviar.	Herring.	Pike.	Sole.
Carp.	Lamprey.	Pollock.	Sword-fish.
Cod.	Lanquet.	Rouget.	Sturgeon.
Cockle.	Ling.	Roach.	Turbot.
Cusk.	Lobster.	Sardines.	Tunny.
Conger eels.	Mackerel.	Salmon.	White-fish.
Eels.	Mullet.	Shad.	Whiting.
Flounders.	Menhaden.		

#### AUSTRIA.

From this country there was but one exhibit, of anchovies, coming from Dalmatia.

#### BRITISH COLUMBIA.

The exhibits from British Columbia consisted mainly of salmon, prepared in cans, which were of good quality. Salmon-trout were put up, salted, in barrels. Notwithstanding the distance from the point of curing, and the warm summer weather at the place of exhibition, all the preparations were sound and edible. One fish, the oolachan, which was of good quality, was sent from British Columbia.

#### BRAZIL.

There was but one exhibit, a salted preparation of ox-fish, which was apparently too coarse to be available as food, outside of the country of its production.

#### CANADA.

The exhibits of the Dominion of Canada, in Class 642, were numerous. In such staple products as cod, haddock, and mackerel, herring, tongues, and sounds, the exhibits were of the finest quality. In preparations of salmon (canned) the exhibits were good. In the



canned preparations of other fish, it was thought that the progress had not been so marked.

#### CHINA.

The preparations of fish coming from China were apparently rather curious than excellent. The Chinese have a method of curing fish, peculiar to themselves, which consists in drying and reducing to an almost impalpable powder all kinds of fish, so that it becomes quite impossible to distinguish the variety used. Among their preparations, they use the dried fins of the white and black, and white sharks. Europeans residing in China declare that such preparations, made from the fins of sharks, are excellent.

The following information given by Mr. Kwong Ki Chui, member of the Chinese Educational Mission in the United States, furnishes some interesting data as to the kinds of fish found and used in China.

*Question.* Are there any salmon in China?

*Answer.* Yes; there are in the sea, but not in large quantity.

*Q.* What are the principal sea-fish?

*A.* Mackerel, shad, garoupa, sole, herring, pike, shark, prawn, shrimp, crab, lobster.

*Q.* What proportion of fish enters into the daily diet of the Chinese?

*A.* We use fish as much as meat for every meal, and a majority of us use a little salted fish in addition.

*Q.* Does China import any fish?

*A.* Yes, we do; we import a large quantity of the following dried fish: flat-fish (Japan), abalony, or awabi (Japan and California), beche-de-mer (Japan and Sydney, Australia), shark's fins (Japan, and some islands in China Sea), scallop (Japan).

*Q.* What are the principal fresh-water fish?

*A.* They are shad (we call it fresh- and salt-water fish), mati-fish, and many kinds of which I do not know the names in English.

*Q.* Is there any fish-culture, or preparation of fish from their eggs?

*A.* Yes, there is; we raise a great deal of fish in ponds for market. In the front of our villages there are generally some fish-ponds, except those in the northern part of China. In the south there are some places where a large number of fish-ponds straggle in plains. The inhabitants of the interior are, therefore, supplied with fish especially from ponds. The way of raising fish is this: a number of male and female fish of certain kinds are kept in a small pond, and the eggs are laid in spring. After the eggs are changed into fish and it becomes as large as a small finger, it is sold to the fish-pond keeper. He then

puts it into a pond for about six or eight months, when it is caught and sent to market. The following are the fish kept in ponds: carp, pangolin, perch, tench, bream. We also raise oysters in ponds which hold salt and fresh water.

#### CHILI.

This South American republic presented at the Exhibition quite a series of excellent fish-preparations, in cans, due to the enterprise of a single firm of manufacturers, Messrs. Sciaccabuga & Co. This fish-food was found to be of quite superior quality.

#### ENGLAND.

But two exhibits were sent from England: one of salmon and one of Cornish sardines (pilchards). The latter preparation is worthy of notice, as it resembles, in many respects, French sardines. These sardines, put up at Falmouth, in England, are subjected to precisely the same processes as are adopted in France.

#### FRANCE.

That marked pre-eminence which France enjoys for all alimentary processes was quite as remarkable in her exhibits belonging to Class 642. Principally represented by sardines put up in oil, these goods were of the very finest quality, and were prepared with exceeding elegance and taste. To excellence of material was added that handsome appearance which so distinguishes French food-preparations. To sardines preparations of anchovies and mackerel, in oil, were added. Such exhibits as were presented for competition by French manufacturers were rightly considered as standards of excellence.

#### ITALY.

The exhibits of Italy, although not numerous, were all excellent, and consisted of sardines, anchovies, and eels. Eels coming from the Cammachio eeleries find a large market in South America. The exceeding cheapness of the Italian fish-preparations was very remarkable.

#### JAPAN.

This country had a single exhibit, consisting of salmon salted, smoked, and dried, secured in cotton bags. This fish was not highly salted, but was thoroughly smoked in the curing. Whether that method of preparing salmon was original with the Japanese, or derived from the Dutch, was not ascertained. The Japanese Commissioner stated that the catch of salmon on the west coast of Yezo

was exceedingly large, the yield being greater than the consumption. The salmon differed in the preparation from our own or Dutch salmon, in being split through the back, and not through the belly. At Jeddo, the capital of Japan, it was stated that such dried fish were worth twenty-five cents each. Information was obtained that mackerel, bass, and cod were salted and dried, and that many other kinds of fresh- and salt-water fish were arranged for food according to the Chinese method, that is, by drying and pounding. The quantity of salmon caught in the rivers of Japan was stated by the Commissioner to be fully 48,000,000 pounds. As one of the advantages derived from the interchange of thought at the International Exhibition, it is believed that the native Japanese will acquire the American methods of preparing salmon, as in use on our Pacific coast, and will thus be enabled to supply China with this excellent fish-food.

#### NETHERLANDS.

The Netherlands were but poorly represented in Class 642. Such exhibits as were made consisted of salmon, soles, and herrings. These only showed the highest grades of canned goods, the staple fish-products not being presented. Such exhibits as were examined were of good quality.

#### NORWAY.

Prominent among all the exhibits in Group V. were those of Class 642, due to Norway. Almost every edible fish caught on the coast of Norway was found. Codfish, haddock, ling, cusk, were shown in their dried form. Such dried preparations were apparently used to some degree for home consumption, or in the North of Europe, though a certain quantity is sent to more distant markets. Dried cod, without salt, has various appellations, derived sometimes from the seasons in which the fish is caught, or from the cut of the fish, as prepared for various markets. Such fish as were dried (without salt) kept perfectly sweet during the American summer. Salted codfish was remarkably well prepared, and in the higher grades of fish showed the care taken in trimming and cutting them. Preparations of dried and salted ling were also found to be excellent. Cusk, dried (without salt), was also found to be a good preparation. In herrings, there were numerous exhibits, smoked, salted, and pickled, and prepared with oil. Of anchovies (pilchards) prepared with bay-leaves, there were numerous examples, all good of their kind, neatly put up, and remarkable for their cheapness. In mackerel, the method of preparing the fish by salting did not seem to be employed. This fish, caught in fair quantity on the coast of Norway, finds a market

in England, where it is sold fresh, being transported in ice. There was but a single preparation of mackerel, and that was put up in oil. In salmon, there were several preparations, some put up in the manner common to America, and some in oil. The color of the Norwegian salmon, when canned, seemed somewhat lighter than our American fish (*Salmo salar*). Certain carefully arranged preparations of fish, designated as fish-cakes, seasoned with wine and other sauces, were excellent. Other exhibits of fish-cakes, consisting of dried fish, ground into meal, and then made into biscuits, were suggestive of an excellent method of utilizing fish when found in great abundance, and of obtaining good food in a comparatively small bulk. Exhibits of fish-meal, the material from which the fish-biscuits were made, were found to be excellent. Caviar, made of cod-roe, was a good preparation. Cod-roses, which are put up in large quantities in Norway, for exportation to France, where they are used by French fishermen in baiting for sardines, were among the exhibits. Such products derived from the cod as tongues and sounds were of the finest preparation, being put up specially for the West Indian and Australian markets. With very rare exceptions, all the preparations of fish from Norway kept in a perfectly sound condition through the months of June, July, and August, and at the conclusion of the Exhibition were excellent.

#### PORTUGAL.

The exhibits made by Portugal were of the most varied character, in fact, exceeded in quantity those of any other country at the International Exhibition. The general excellence of the Portuguese fish-productions was quite remarkable. Owing to the cheapness of oil in the country, the canned goods made in Portugal were very low-priced. A large export trade to Brazil seems to have fostered the canning business. It was not alone in the finer preparations of fish that the care taken by the Portuguese was manifest, but in the cruder preparations the same skill was evident. The variety of fish was very large, including almost every edible fresh- and salt-water fish found in the country and on the coast. Certain methods of preparing sardines by salting, and pressing them in bulk, were thought worthy of particular notice. In regard, then, both to excellence and variety of fish-products, Portugal occupied a position second to none in the Exhibition.

#### RUSSIA.

In Class 642, more especially in canned fish, Russia had but little on exhibition. Its fish-products were, however, excellent of their kind. In caviar the exhibits were more numerous, and were of fine

quality. A peculiar preparation called veziga, made from the spinal cord of the sturgeon, used as a delicacy in Russia, was among the exhibits.

#### SPAIN.

In Class 642, the exhibits of Spain were very numerous. Great attention seems to have been paid, not only to the preparations of fish which could be used by the wealthier classes, but also to such staple fish as would serve for the food of the poorer classes. Pilchards in bulk, smoked, salted, and pressed, were of a very superior quality. In the higher grades of canned goods, Spain, having a considerable export trade, puts up such preparations as are especially adapted for colonial use. The range of fish used in Spain is exceedingly large. The excellence of Spanish oil, and its cheapness, allow her to produce high grades of canned food at exceedingly low prices. As in Portugal, manufacturers of canned goods do not restrict themselves to a single preparation of the same fish, but have various methods of arranging it.

#### TURKEY.

This country had but a single exhibit, botargo, a preparation of mullet's roe, closely resembling the same substance as is put up in Florida. This preparation was excellent, and kept sweet and sound during the summer.

#### UNITED STATES.

The following States sent exhibits belonging to Class 642: California, Maine, Massachusetts, New York, New Jersey, and Oregon. The prominence salmon-fishing and the preparation of salmon have taken on the Pacific coast was strikingly represented. Exhibits of canned salmon coming from the State of Oregon, and principally from the Columbia River, were of very good quality. Extensive factories on the Columbia River, during from three to four months of the year, are constantly at work preparing canned salmon, and find for their products a market in all parts of the world. The certainty of the catch, and the cheapness of the product, together with its excellence, have led to these results. In 1875, it was estimated that the total make of canned salmon on the Columbia River was about 16,000,000 pounds. For preserving processes, rather than for table use as fresh fish, the fat condition and handsome color of the flesh of the *Salmo quinnat* of the Pacific market is a better fish for canning than the *Salmo sular* of the Atlantic coast. Without an exception, all preparations of salmon put up on the Pacific coast were excellent, and

were thought to be superior to those coming from other countries. In fact, the cheapness of these Pacific preparations of salmon has, in a certain degree, driven out all other canned salmon. It was quite evident to the Judges that great progress had been made in this special branch of canning. Salmon salted in barrels, coming from the Pacific coast, was excellent, and was remarkable for its cheapness. In canned preparations of staple fish, such as mackerel, put up in the New England States, the progress was not so marked as in California canned goods. The Eastern goods were often somewhat wanting in care as to preparation, and though the fish kept sweet and good, in flavor, and especially in appearance, they did not equal similar fish put up in other countries. In certain kinds of fish, especially menhaden, prepared like sardines, notable progress was, however, visible. It is worthy of mention, that a class of goods closely resembling the finer grades of fish put up in Norway and Sweden, called there *delicatessen*, are now being put up in the United States, more especially to supply the wants of our foreign citizens. Such preparations were found to be remarkably good. In caviar, an excellent effort has been made to bring into use the roes of sturgeons, and very good preparations of caviar, manufactured in San Francisco and in Milwaukee, were among the exhibits, and were deemed worthy of an award. It is to be regretted that there were no exhibits of salted cod, nor of any of the staple preparations of fish. An extract of fish made from the menhaden, due to a manufacturer in Maine, was thought worthy of special commendation. This product was excellent, without any fishy taste or odor, and closely resembled the extract of beef. For use as a substitute for the extract of meat, this preparation, it was thought, might present certain advantages. As it could be made in quantity where any kind of fish is caught in abundance, it seemed to resolve the problem of utilizing all portions of the fish, as the manufacture did not preclude the extraction of the oil, nor the subsequent conversion of what was left of the fish into manure.

#### CANS.

No marked progress was visible in the manufacture of the cans. In Sweden, tin cans were used, with a large hole in the top of them, which hole was closed with a cork, which was sealed up. This method, which was not a good one, it was understood, was only used in order to evade certain duties. Certain inventions, due to France, in the method of securing the covers to cans, were presented, but these were mainly directed towards facilitating the opening of the can. Paper boxes, of thick material, covered with a varnish, were

also on exhibition from Sweden, but were believed to present no particular advantages. The excellence of the French cans was particularly conspicuous. As nothing but metal is used in France, even for the labels, it was thought that any imperfections in the cans might be more immediately visible by the manufacturers. Very generally, American cans were not remarkable for neatness of form, and did not equal those made in other countries. It is thought that, by greater attention to details in the manufacture of cans in the United States, some advantage might be derived. Spanish and Portuguese cans, closely resembling the French in form, were excellent.

#### GENERAL REMARKS.

In examining the fish consumed fresh as food, or put up for exportation, it is found that, whereas in the United States we restrict ourselves to a few fish, such as cod, mackerel, herrings, and salmon, in other countries the kinds of fish salted, dried, pickled, or canned by far exceed those we prepare. Again, in the preparation of fish in the United States, we restrict ourselves to one or two methods of curing or canning. In other countries, preparations of the same kind of fish are varied. Sometimes the same fish is put up in half a dozen different ways. It is quite evident, then, that in the United States we refuse to eat certain kinds of fish, or to prepare them for future use. This wastefulness of fish, excellent as food, is quite apparent. Whether this fact arises from prejudice or ignorance it is difficult to determine. When comparing the fish-preparations of Portugal, with its limited sea-coast, with our own, the great variety of fish used as food in Portugal is quite remarkable. Deductions of this character are, of course, more directed to quality than quantity. Though in salmon we quite equal, if we do not surpass, similar canned preparations of salmon produced in other countries, in other canned fish the United States is inferior to those derived from this source. It was in the more careful preparation of fish-food, and in the variety furnished, that the exhibits in Class 642, coming from other countries, were pre-eminent. Very noticeable among the fish-preparations were those furnished by Norway. In Norway, in addition to cod, the ling, hake, and pollock are used. If Norwegian dried fish resolve the problem of giving the greatest quantity of food in the smallest bulk, it has not been determined whether the climate of America would permit of the natural desiccation of fish. It is not certain either that desiccated food, when used in large quantity, is really as nutritious as salted food. In Norway, and in the northern countries of Europe, dried fish is mostly eaten with the addition of some alkaline substance

in solution. It seems as if the absolute desiccation of fish in some way changed the character of fish-food, and made it less assimilable to the human organism, unless subjected to some soaking in an alkaline water. Particular attention seems to have been paid by foreign Commissioners to our own methods of curing and salting staple fish. The American way of storing fish in ice, either on board of the fishing-vessel or in warehouses with refrigerators, has occupied the particular attention of foreign experts.

In the finest preparations of fish, such as sardines, the high position taken by France has been before mentioned. What is wanted, then, in the United States, is a greater variety of preparations of fish, and the utilization of certain kinds of fish now neglected. These fish would not only be found excellent for immediate consumption in a fresh state, but, properly put up either for future use or exportation, would undoubtedly add to our national food, and might considerably increase our commerce abroad, with the greatest advantage to our general fishing interests.

#### CLASS 643.—CRUSTACEANS, ECHINODERMS, BECHE-DE-MER.

Class 643 presented no special features. Most of the exhibits in lobsters came from Nova Scotia, with some from Maine and from Massachusetts, and two from Norway. These products were generally excellent, and showed care in preparation.

#### CLASS 644.—MOLLUSKS (OYSTERS, CLAMS, ETC.) USED FOR FOOD.

This important class was represented by exhibits from the United States, Spain, Portugal, and Chili. Oysters, pickled and preserved in various ways, and clams, came from the United States, the finer varieties especially from Baltimore. The excellence of the methods employed, and the fine flavor and appearance of the canned preparations of oysters presented by the United States, were quite noticeable. The Spanish and Portuguese preparations were varied as to flavors and seasonings. Chili also had an excellent exhibit of oysters and mussels peculiar to her sea-coast. It is believed that if the oyster-canners in Baltimore were to prepare oysters especially put up for use on the Continent, more particularly to meet the French demand, an important branch of business might be opened. The preparation of oysters being carried on more largely in the United States than in any other country, special facilities seem to have been acquired in the methods of preservation. Some methods of keeping oysters in oil were peculiar to Spain and Portugal.



## CLASS 645.—SHELLS, CORALS, AND PEARLS.

This class presented no exhibits of special interest or merit, save a fine collection of corals from Bermuda.

## CLASS 646.—WHALEBONE, SHAGREEN, FISH-GLUE, ISINGLASS, SOUNDS.

In whalebone, the United States had two exhibits, both of whalebone for general purposes, in its rough and finished condition. In shagreen, the only exhibits were from Japan. Beautifully prepared skins of the shark (shagreen) were found in the Japanese collection. A peculiar kind of shagreen, derived from the sturgeon, was also among the Japanese exhibits. In fish-glue, isinglass, and sounds, the exhibits were numerous. Prominent among the samples of isinglass were those of Russian make derived from the sturgeon. Russian isinglass, besides being used for fining and clearing wines and fermented liquors, such as beer and ale, is employed to a considerable extent as a glaze or dressing for silk, velvet, and satin fabrics. The exhibits from Russia were excellent in quality. The demand for a "fining" substance, capable of removing the albuminous or other impurities in malt liquors manufactured in the United States, has been fully met by a preparation made from the sounds of the hake. The isinglass furnished by a number of manufacturers in the United States, made principally from the sounds of the hake, fully answered the purposes for which it was intended. American isinglass has almost entirely supplanted in the United States all imported substances. The demand for this American isinglass has increased very much of late years, it being used largely by the German brewers. The care shown in the manufacture of this particular isinglass, evidenced by its clear color and perfect solubility, was thought to show marked progress. It would be worth while for manufacturers of this American isinglass (made from the hake) to find out whether, in case of a surplus, this substance might not be used in England, France, or Italy, as a glaze or dressing for silk-goods. Some isinglass from the United States, resembling the Russian and made from the sounds of the sturgeon, was of good quality. A valuable product prepared from the skins of the cod, partaking more of the character of a glue than of isinglass, was thought worthy of special mention, as utilizing a substance hitherto thought to be of little value. Isinglass from Brazil, made by simply stripping the bladder of a fish called the pascada, was of fine quality. Norway exhibited a good quality of isinglass. In the Chinese collection there were found good specimens

of isinglass, which, it was understood, was used as food. In point of cost the American product compared quite favorably with the Russian.

CLASS 647.—INSTRUMENTS AND APPARATUS OF FISHING—NETS, BASKETS, HOOKS, AND OTHER APPARATUS USED IN CATCHING FISH.

This important class was very fully represented, specimens of nets, lines, hooks, traps, etc., being on exhibition from Norway, Sweden, the Netherlands, China, Japan, Spain, Germany, and the United States. The general collection was not only complete as to the apparatus used in catching fish as a business, but abounded with the finer implements used by sportsmen. The general construction of nets coming from foreign countries differed but little from those of American manufacture, except in the exhibits from the Netherlands. The drag-nets from Holland were made of exceedingly strong material, were mounted on a boom, and were used to catch flat fish, such as turbot, etc., found at the bottom of the German Ocean. Great strength and careful knotting were the distinguishing characteristics of the Netherlands apparatus. In Norway, both cotton and flax nets were shown. The use of gilling-nets for small fish, such as herrings, seemed to be more employed in the northern fishing regions of Europe than in the United States. In some instances, the floats employed were made of glass. In deep fishing, it is doubtful whether glass floats would present any great advantages, as from experiments tried in the deep-lake fishing in the United States, water has been known to force itself through the pores of the glass. The devices used by fishermen in Northern Europe to sink their nets are in some of the poorer portions of that country quite primitive. Stones, either with a hole bored through them or tied without perforation to the nets, or the split shank-bones of sheep, are used. In some cases sinkers are made of baked clay. For floats, instead of cork, the light bark of the northern pine, or portions of fir-cones imbued with a varnish, are used. In lines, such as are used for catching cod, no great variation of form from those employed by our New England fishermen was discoverable. A close inspection sometimes showed that the method of arranging the hook, or the form of the leaden sinker, were somewhat different from our own; but on careful inquiry into the manner of arranging hooks or sinkers as used by foreign fishermen, it was ascertained that such methods were known in the United States, and were either in use or had been abandoned for some more approved plans. In the shaping of hooks, the

variations were so slight as, in many cases, to be hardly noticeable. In Spanish machine-made nets, the two exhibits were excellent. The American exhibit of nets was wonderfully complete, and showed apparatus intended for the capture of every kind of fish found on our coast. The general tendency to use cotton for nets seems to imply its superiority over all other material. The great ingenuity displayed in nets and seines of American planning, apart from the excellence of the material, was quite conspicuous. In fact, nets of American manufacture, made especially for European use, are now in demand abroad. In the apparatus used by sportsmen, the American exhibit was excellent. It is to be regretted that no opportunity was allowed to compare them with those of English make. The variety of reels of American make, of simple and compound construction, devised for trout-, salmon-, or for sea-fishing, was a feature of the Exhibition. In the Japanese exhibits of fishing-implements, the excellence and neatness displayed in their various apparatus were quite remarkable. For preserving their nets and lines the dried juice of the persimmon is used by the Japanese. In the Chinese exhibits of Class 647, peculiarly constructed fish-traps, which worked automatically with the falling and rising of the tides, were conspicuous. In apparatus serving for dredging oysters, and for lifting such dredges, the American exhibits were of the most serviceable character. The general conclusion to be derived from a close comparison between the fishing-apparatus used by fishermen in other countries and by American fishermen, is quite favorable to the latter. Nets made of ramie fibre, coming from Liberia, were apparently of great strength and flexibility.

CLASS 648.—FISH-CULTURE—AQUARIA, HATCHING-POOLS, VESSELS  
FOR TRANSPORTING ROE AND SPAWN, AND OTHER APPARATUS USED  
IN FISH-BREEDING, CULTURE, OR PRESERVATION.

The entire list of exhibits belonging to Class 648 came from the United States, and represented all the varieties of apparatus used in fish-culture, either for the hatching of the eggs or for the transportation of the young fish. American fish-culturists having first resolved the problem of subjecting the spawn of fish to long land transits, the apparatus used in transporting the ova of the California salmon from the Pacific to the Atlantic coast was on exhibition. Such receptacles for the transportation of fish were simple in character, the principles of aerating being carried out either by hand or by readily understood mechanical arrangements. In hatching-apparatus, as for salmon, no very great improvements have been made over those in use in 1875. In shad-hatching, the method employed by the Fish Commissioners

of the State of New York—one which had led to excellent practical results—was deemed worthy of especial mention. A shad hatching-trough of a new pattern, a modification of the New York hatching-trough, was believed to possess some excellent features. It is a necessity in fish-culture that all apparatus shall be of the most simple character and obtainable at a small outlay, and the exhibits were remarkable in both these respects. In models of a fish-hatching establishment, the fac-simile of the one at Druid Hill, Baltimore, in use by the Maryland Fish Commission, was remarkable for thoroughness of detail. During the period of the Exhibition, at the Maryland Building, the process of hatching the eggs of the California salmon was successfully carried on. It is quite apparent that, from the different character of fish-ova, the constructions of fish-hatching apparatus must be considerably varied. Such major improvements as fish-culturists are now looking to are mainly directed towards the saving of labor in manipulating the eggs of the young fish. The problem of the development of the eggs seems to have been, in a very great measure, already solved. The success attending the taking of the eggs of fish, and their fecundation, may be fully understood when, with such apparatus as was at the Exhibition, as many as fifty millions of shad have been hatched out in a season at a single American station. The erection of dams on rivers being one of the great causes of the absence of fish in streams, the attention of fish-culturists has been directed towards the proper construction of fish-ways. The Exhibition presented a series of models of fish-ways, all having certain features of excellence.

The Centennial Exhibition was in its broadest sense founded on the grand principle of an exchange of thought, and that portion represented in Group V. may prove of great advantage to other countries, by affording them opportunities of studying our methods of fish-capture, while in exchange we may take from them many approved ways of preparing fish as food. As to fish-culture, both the United States and Canada have performed greater feats, and have arrived at more useful results, than Europe. If it is to the Old World that we owe fish-culture, it is in the New that it has taken its most practical development.

## AMERICAN METHOD OF PREPARING CANNED SALMON

The American method of canning salmon differs in some important respects from the modes of putting up fish practiced in Europe. As time and labor are of importance in the United States, the effort in preparing food has been mainly directed to arrive at immediate results. The salmon is cooked in the cans in which it is put up. In all fish put up in oil or canned in Europe, the fish is first partially or entirely cooked in distinct vessels, and then transferred to the cans, where another cooking or heating takes place before the closing of the tins is effected. The process of canning the salmon of the Columbia River, at Astoria, may be briefly described as follows: As soon as the fish caught during the night are landed at daybreak at the factory, gangs of Chinamen take the fish, scale and clean them, cut off heads, tails, and fins, and place the fish in tanks filled with salt and water. Here the salmon remain for a certain length of time, and the cleansing process is known as "sliming." Now the fish are brought into the factory. A Chinaman with a peculiar machine, at a single stroke of a lever, cuts the fish into exactly the proper-sized slices which will fit the cans. Another set of hands take these bits of fish, place them deftly in the cans, whence they go to other workmen, whose duty it is, by means of an apparatus, to put in each can a small amount of brine; nothing else is added, the salmon being cooked *au jus*. Now the cans filled with the raw fish pass to workmen, who apply the lid and solder it on. Next, the cans are placed, hundreds together, in iron rings, each form holding 800 cans, and, by means of cranes, all lowered into steam-boilers, where they are cooked for an hour. Now quite a nice operation takes place, similar to that employed by the champagne-wine manufacturers, which is called venting. A hole is pricked in the top of the can, and the air and the gases generated are allowed to escape, when the little vent-hole is instantly re-soldered again. A second cooking now takes place, when the culinary portion of canning is ended. The cans are again taken from the boilers, and are showered with cold water. If the vacuum is perfect, and the package sound, the top of the can hollows in and assumes a concave form. If, however, there is the least

convexity, this condition of "swell heads," as it is called, causes the rejection of the package, for the salmon would not keep a week, and manufacturers know that a single spoiled can would injure the reputation of a thousand packages. It will not even do to tinker with these "swell heads," as they would cost too much to put in order. If they are worked over, however, they are never shipped as first-class goods. It is a necessity, in order to insure the excellence of the canned product, that each day's catch of fish should be prepared within twenty-four hours. Should there be any hitch in the factory and all the day's salmon cannot be canned, what remains over is salted and barreled. So far, the barreling of salmon has by no means been profitable, a barrel of salted salmon being worth only seven dollars the two hundred pounds; and three and one-half cents a pound is very cheap food indeed. These salted fish are, however, finding a market in the United States, where they are freshened and smoked. It is, perhaps, not out of the way to say that the can of salmon, before it is completed, with a handsome label put on it, and boxed, goes through as many as a hundred different operations, from the catching of the fish until it is sold as a finished product. Through April, May, June, and July the factory has no idle moment. The fishermen ply their nets all night, and the Chinamen work all day and up to ten o'clock at night, when the canning is carried on by gas-light.

Oregon salmon, as a canned product, has nearly driven out all other similar preparations of the fish, and the Eastern establishments are fast passing out of existence. In 1875 England took 165,600 cases of Oregon salmon; New England, 2400; South America, 1500; Australia, 14,190; and New York and the Atlantic coast, some 57,571. The European demand for the canned salmon product of Oregon is steadily increasing, and the cry is a constant one for more. The value of salmon as put up on the Columbia River alone is estimated at \$2,500,000.

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#### METHOD OF PREPARING SARDINES IN FRANCE.

The sardine being a very delicate fish, the utmost attention is directed towards having the fish as fresh as possible, and as near as can be to the *usine* or factory where it is to be canned. Factories are therefore situated rarely more than two or three hours' distance from the place where the fish are caught. The fish are placed on stone tables; women pluck off the heads, which operation removes the en-

trails. The fish are then placed on wooden slats and allowed to drip; are slightly salted, and remain over-night. Next day they are again slightly salted, and allowed to dry. The old and most approved method of cooking sardines is to place them in vessels filled with hot oil, where they are cooked. When the fish are done, they are put into a wire basket to drip. At exactly the right point of cooking, the scales remain on the fish, which is desirable. If the cooking has been carried on too much, or if the fish are too fat, the scales drop off, which impairs the value of the canned fish. A period of from five to six minutes is about the right time for this *cuisson* (cooking) in the hot oil. The fish are allowed to drip carefully, with the head-part downward. When the fish are cold, they are placed on tables, and arranged by women in the tin boxes, the oil being dipped from barrels into the boxes. The oil being intrinsically dearer than the fish, efforts are made, without too much crowding, to put as many sardines as possible in a box. Soldering of the lids of the boxes then takes place, and the boxes are then heated in receptacles by means of steam. The sooner this heating of the boxes, with their contents, takes place the better. The temperature of the water in which the boxes of sardines is placed is at first cold, and the steam is gradually introduced. This second heating is sometimes carried on for an hour and a quarter. When sufficient time has been taken to heat the boxes, they are sometimes allowed to cool in the water, particular pains being taken at all times not to move the boxes too much. Another method, and a cheaper one, of preparing sardines, is to cook them without oil, in a circular oven. The after-processes are the same as before described. Sardines are most prized when not too large in size. Whereas those which are of approved size may be worth six francs a thousand, as delivered by the fishermen; if too large, these fish are worth only four francs. As the sardines are migratory, a shoal of fish sometimes remaining at a fishing-station for but a week and then going somewhere else, extensive French canners have sometimes two factories, situated at different localities on the coast. About from three to four months—from the middle of May to the 15th of August—is the time of the sardine catch, and of the canning. Factories engaged in the preparation of sardines do not devote their attention solely to the putting up of these fish, but prepare other alimentary substances during their idle time.

## AMERICAN ISINGLASS.

The best quality of American isinglass is made from the sounds of the hake. The crude material is collected during the summer and autumn, coming from Maine, New Brunswick, Nova Scotia, and Prince Edward's Island. The conversion of the crude material into the mercantile article takes place in winter. A low temperature is necessary, in order to turn out by machinery the fine ribbons of isinglass, and ice-water passes through the rolls. The total product is about 250,000 pounds. Besides the use of isinglass for fining beer, etc., it is employed as a dressing or glaze for straw goods in the United States.

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## PROCESS OF MAKING PLASTER CASTS OF FISH.

Fish are taken as fresh and perfect as possible, wiped with a cloth, not only to dry the moisture, but to remove the mucous secretions. The fish is then laid on a flat, smooth board, and placed in a natural position by means of little lumps or wedges of potter's clay, raising the parts liable to drop below the axis of the fish. The fins are spread out upon flat cushions made of potter's clay, and are kept in their spread position by means of pins. When the fish has been firmly set in a natural position, a rather thin mixture of plaster of Paris and water is poured over the fish, and repeated coatings of this material are applied until a sufficient thickness is attained, when it is allowed to set moderately hard. The mould is now turned over and the fish removed. When the cast is made, a slight coating of shellac varnish is applied throughout the inside of the mould. The plaster of Paris mixture is then poured in, and when sufficiently "set," the mould is chiseled away, the shellac coat guiding the workman as to the depth it is safe to cut. The cast is now trimmed of its rough edges and projections, and a square stiff frame having been made, with the inner edges studded with nails, the cast is placed within it, lying on a flat table, and plaster of Paris is then poured within the frame until it rises to the level of the edges. Embracing the base of the cast, it also adheres firmly to the inside of the frame, and when "set," is lifted from the table. The plaster matrix which now becomes the background of the fish is smoothed. The plaster cast is now ready for coloring.





# REPORTS ON AWARDS.

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## GROUP V.

### 1. Prof. Alexander Agassiz, Museum of Cambridge, Mass., U. S.

WATER-COLOR SKETCHES OF FISHES OF CALIFORNIA COASTS.

*Report.*—Commended for great accuracy and faithful coloring.

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### 2. Eugene G. Blackford, New York, N. Y., U. S.

LIVE FISH IN AQUARIA, WITH FISH IN REFRIGERATORS.

*Report.*—Commended for a collection of live fish in aquaria, and for a very general exhibit of almost all the edible fish found on the Atlantic coast, with specimens from the Pacific, and from the rivers and lakes of the United States; for keen interest taken by Mr. Eugene G. Blackford in American fishes, and assistance rendered by him in the study of ichthyology.

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### 3. Museum of Bergen, Bergen, Norway.

COLLECTION OF MAMMALS, FISHES, CRUSTACEANS, MOLLUSKS, AND OYSTERS; MODELS OF BOATS.

*Report.*—The models of boats are well made, and the large collection of fishes, mollusks, etc., are well preserved; the whole being a very complete collection.

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### 4. Government of Bermuda.

COLLECTION OF BERMUDA FISH ALIVE, INCLUDING PARROT-FISH, GRUNTS, SQUIRREL-FISH, AND GROOPERS.

*Report.*—Commended for general character of exhibit, as illustrating the fish of Bermuda in their live state.

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### 5. Charles Dury, Cincinnati, Ohio, U. S.

SPECIMENS OF LAKE FISH.

*Report.*—A very good and well prepared collection of fish.

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### 6. Educational Department, Toronto, Ontario, Canada.

PREPARED FISH.

*Report.*—Commended as well prepared.

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### 7. John H. Klippart, Columbus, Ohio, U. S.

LIVE FISH.

*Report.*—An interesting exhibit of live fish in good condition.

## 8. Paulis Roeter, Museum of Cambridge, Mass., U. S.

WATER-COLOR SKETCHES OF NORTH AMERICAN FISHES.

*Report.*—Commended for exceeding accuracy of drawing and color.

## 9. F. St. John, Melbourne, Victoria, Australia.

SPECIMENS OF PREPARED FISH.

*Report.*—Commended as well prepared and in good state of preservation.

## 10. Alden Sea Food Co., New York, N. Y., U. S.

DRIED TURTLE, DRIED COD, AND DRIED CLAMS.

*Report.*—Commended for good preparation, and for presenting products in a desiccated form.

## 11. Antonio Avellino fu Giuseppe, Leghorn, Italy.

SARDINES IN OIL.

*Report.*—Commended for good preparation, choice fish, and fine oil.

## 12. Adolph Asmann, San Francisco, Cal., U. S.

CAVIAR, PREPARED FROM STURGEON ROES.

*Report.*—Commended for excellence in preparation and having withstood the very warm weather, remaining perfectly sound and good.

## 13. Commissioners of Tasmania.

BROWN TROUT.

*Report.*—Commended as being a fine specimen, showing the result of the introduction of a new species into Tasmania.

## 14. American Boneless Sardine Co., New York, N. Y., U. S.

AMERICAN BONELESS SARDINES.

*Report.*—Commended for very careful preparation, excellent in taste, well put up, and as made from the menhaden, a fish usually condemned as refuse.

## 15. Gustaf Anderson, Fjellbacka, Sweden.

ANCHOVIES.

*Report.*—Commended for exceedingly good preparation.

## 16. Arzadum &amp; Co., Pontevedra, Spain.

SQUID IN OIL, CLAMS, RODAVALLO, MERLUSA SARDINES, SARDINES WITH OIL AND TOMATOES.

*Report.*—Commended for general excellence, fine preparation, and good oil, with fine flavor.

## 17. Ascencio José dos Santos, Vianna do Castello, Valença, Portugal.

SHAD IN OIL, PICKLED SALMON AND LAMPREY.

*Report.*—Commended for very good preparation.

## 18. Max Ams, New York, N. Y., U. S.

## PRESERVED FISH.

*Report.*—Commended for general variety of products, with great excellence; pickled eels, caviar, pickled salmon, anchovies, and sardines.

## 19. H. C. Bergstrom, Lysekil, Sweden.

## ANCHOVIES.

*Report.*—Commended for exceeding excellence of preparation.

## 20. Bordewich &amp; Co., Lyngvæ, Norway.

## COD ROE CAVIAR, FISH MEAL, ISINGLASS, AND PLUCK FISH.

*Report.*—Commended for great excellence in preparation.

## 21. James Barber, Halifax, Nova Scotia.

## CANNED LOBSTER AND CANNED MACKEREL.

*Report.*—Commended for good preparation.

## 22. J. D. Bain, Restigouche, New Brunswick.

## CANNED MACKEREL, CANNED LOBSTER, AND CANNED SALMON.

*Report.*—Commended for excellence of preparation.

## 23. Bergens-Rogeri, Bergen, Norway.

## SMOKED RED HERRING.

*Report.*—Commended for perfect preservation, the flavor being excellent.

## 24. A. Booth &amp; Co., Oregon, U. S.

## PRESERVED SALMON.

*Report.*—Commended for very great excellence, the preparation being wonderfully sound and of choice flavor.

## 25. Burnham &amp; Morrill, Portland, Me., U. S.

## CANNED MACKEREL, CANNED LOBSTER, AND CLAMS.

*Report.*—Commended for very great excellence in preparation and good flavor.

## 26. Board of Commerce, Bergen, Norway.

## SALTED HERRING AND COD, DRIED COD, COD ROES, COD OIL, DRIED LING AND CUSK.

*Report.*—Commended for fine preparation of the various kinds of fish.

## 27. A. S. Crowe, Halifax, Nova Scotia.

## SALTED AND DRIED HADDOCK, SALTED HAKE, SALTED POLLOCK, AND SMOKED HERRING.

*Report.*—Commended for great excellence in all the preparations in the exhibit.

## 28. Crosse &amp; Blackwell, London, England.

## SALMON.

*Report.*—Commended for excellent preparation.

## 29. J. W. &amp; V. Cook, Oregon Packing Co., Clifton, Oregon, U. S.

SALMON IN PICKLE AND IN CANS.

*Report.*—Commended for very excellent preparation, the salted salmon in barrels having withstood for some time the heat.

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## 30. President Vianna Commission, Vianna do Castello, Portugal.

LAMPREY IN OIL.

*Report.*—Commended for very good preparation.

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## 31. Povoense Factory, Povo de Varzim, Portugal.

CONGER EEL IN OIL, BREAM IN OIL, SHAD IN OIL, SARDINES IN OIL, AND OYSTERS.

*Report.*—Commended for very general exhibit of fish and oysters, all of them excellent as to flavor.

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## 32. Henrick Dons, Christiania, Norway.

FISH CAKES AND SMOKED HERRING IN OIL.

*Report.*—Commended for exceedingly fine preparation and good taste.

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## 33. Feliciano Antonia da Rocha, Setubal, Portugal.

LONGER EELS IN OIL, SARDINES, THREE VARIETIES, SWORD-FISH IN OIL, SHAD IN OIL, LINGUADO IN OIL, BREAM IN OIL, BESUGO IN OIL, CACHUCHO IN OIL, GOBAS IN OIL, RED MULLET, EELS IN OIL.

*Report.*—Commended for great variety of products and general excellence.

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## 34. A. Dufour &amp; Co., Bordeaux, France.

SARDINES IN OIL (VICTORIA).

*Report.*—Commended for general excellence, this product being of the finest quality.

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## 35. Dandicolle, Son, &amp; Gaudin, Bordeaux, France.

SARDINES AND RAYONS IN OIL, SARDINES IN OIL WITH TRUFFLES, ANCHOVIES, SARDINES IN OIL.

*Report.*—Commended for very remarkable excellence in preparation, fine fish and good oil.

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## 36. Edv. Nilsson, Grebbestad, Sweden.

MACKEREL IN OIL.

*Report.*—Commended for most excellent preparation, fine flavor, and generally handsome appearance.

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## 37. N. O. Ericsson, Lysekil, Sweden.

SARDINES IN OIL AND ANCHOVY.

*Report.*—Commended for excellent preparation.

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## 38. Petter Egidius, Bergen, Norway.

ANCHOVIES WITH BAY LEAVES.

*Report.*—Commended for very excellent preparation.

## 39. João da Silva Ferrão de Castello Branco, Lisbon, Portugal.

SARDINES IN OIL (TWO KINDS).

*Report.*—Commended for great excellence of preparation and purity of oil.

## 40. Charles A. Tryer, Whitehall, England.

PILCHARDS IN OIL.

*Report.*—Commended for excellence of preparation.

## 41. Garcia &amp; Pinon, Coruña, Spain.

LANGOSTA EN SALPICON, EELS IN OIL, FRIED FISH IN OIL, BESUGO FRITO.

*Report.*—Commended for general excellence in preparation.

## 42. S. L. Goodale, Saco, Me., U. S.

EXTRACT OF FISH.

*Report.*—Commended for originality of preparation, the extract of fish being made from fish which had hitherto been only used for their oil or for manure. Worthy of mention as the production of a new substance, likely to be found of great service.

## 43. J. J. Hallgren, Oroust, Gullholman, Sweden.

ANCHOVIES AND DÉLICATESSE HERRING.

*Report.*—Commended for very excellent preparation.

## 44. William Hume, Eagle Cliff, Washington Territory, U. S.

CANNED SALMON.

*Report.*—Commended for very good preparation.

## 45. H. A. Helgesen, Aalesund, Norway.

BOILED SALMON, PLUCK FISH, AND FISH CAKES.

*Report.*—Commended for general excellence of preparation, the products being good-flavored.

## 46. Holbrook &amp; Cunningham, Victoria, British Columbia.

CANNED SALMON.

*Report.*—Commended for great excellence in preparation, the salmon retaining its form, taste, and color.

## 47. Hapgood &amp; Co., San Francisco, Cal., U. S.

CANNED SALMON.

*Report.*—Commended for remarkably fine preparation, the fish retaining its color and flavor.

## 48. Joaquin Martinez, Pontevedra, Spain.

SQUID IN OIL, AND EELS AND MUSSELS IN OIL.

*Report.*—Commended for great excellence in preparation.

## REPORTS ON AWARDS.

## 49. Manuel Jose Netto, Setubal, Portugal.

SARDINES IN OIL AND SAUCE, LULLAS IN OIL, MACKEREL IN OIL, SALMONETTE, CORVINA  
IN OIL, HAKE IN OIL.

*Report.*—Commended for very good preparation, and general excellence of material employed.

## 50. Chr. Johnsen, Christiansand, Norway.

SALTED AND DRIED COD.

*Report.*—Commended for good preparation and soundness.

## 51. John Winslow Jones, Portland, Me., U. S.

FRESH MACKEREL AND CANNED LOBSTER.

*Report.*—Commended for particular excellence of preparation. Both the mackerel and lobster were firm and sound and of very good flavor.

## 52. Joseph Colin, Nantes, France.

MACKEREL IN OIL, AND SARDINES IN OIL.

*Report.*—Commended for general excellence of preparation.

## 53. C. C. Just, Christiania, Norway.

ANCHOVIES.

*Report.*—Commended for excellent preparation.

## 54. Kemp, Day, &amp; Co., New York, N. Y., U. S.

CANNED LOBSTERS, MACKEREL, SALMON, OYSTERS, AND LITTLE NECK CLAMS.

*Report.*—Commended for fine preparation and excellence of flavor.

## 55. Braulio Larravide, Laredo, Santander, Spain.

CODFISH IN OIL, SARDINES IN OIL, MULLET IN OIL, BESUGO IN OIL, MACKEREL IN  
OIL, BREGUILLAS IN OIL.

*Report.*—Commended for variety and great excellence in preparation.

## 56. Francisco Ramon Lopez, Vivero, Lugo, Spain.

PILCHARDS, SALTED AND PRESSED.

*Report.*—Commended for excellent preparation, the fish having withstood the excessive heat, remaining sound and good.

## 57. Campelo Leon Caziano, Vianna do Castello, Portugal.

PRESSED AND DRIED SARDINES.

*Report.*—Commended for exceeding excellence of preparation, this exhibit having remained sound and good during the hottest weather.

## 58. Francisco Leite &amp; Co., Alcantarilha, Faro, Portugal.

TUNNY IN BRINE (TWO QUALITIES).

*Report.*—Commended for very good and sound preparation.

59. **W. K. Lewis & Brothers, Boston, Mass., U. S.**

CANNED MACKEREL, LOBSTER, SALMON, AND CLAMS.

*Report.*—Commended for very good preparation.60. **A. Loggie & Co., New Westminster, British Columbia.**

SALTED SALMON, TROUT, AND OOLACHAN, IN BARRELS AND KITS.

*Report.*—Commended for excellent preparation, having withstood the heat; sound and well flavored.61. **Lonit Brothers & Co., Bordeaux, France.**

SARDINES IN OIL, AND ANCHOVIES IN OIL.

*Report.*—Commended for excellence of preparation, and neat construction of cans.62. **Aug. Lysell, Lysekil, Sweden.**

ANCHOVIES IN OIL, AND PICKLED ANCHOVIES.

*Report.*—Commended for great excellence in preparation.63. **Leal, Costa, & Co., Lisbon, Portugal.**

SARDINES IN OIL, SARDINES IN SAUCE, CHERNE ASSADA, FISH IN SAUCE, AND CHERNE EM ESCABECHE.

*Report.*—Commended for great variety of fish, and for general excellence.64. **Georg Lund, Christiania, Norway.**

ANCHOVIES.

*Report.*—Commended for good preparation.65. **Larentz Madson, Aalesund, Norway.**

LING, SALTED AND DRIED.

*Report.*—Commended for very great excellence in preparation, being remarkably sweet and sound.66. **Peter Mohn, Bergen, Norway.**

EXTRA FINE SALT HERRING IN PICKLE.

*Report.*—Commended for excellence of preparation.67. **J. G. Megler & Co., Brookfield, Wyoming Territory, U. S.**

CANNED SALMON.

*Report.*—Commended for good preparation.68. **C. Mangold, St. Petersburg, Russia.**

WHITE FISH, CARP EN MATELOTE, POISSON BLANC AUX TRUFFES.

*Report.*—Commended for good preparation.69. **Nicolo Marsardo, Sampierdarena, Genoa, Italy.**

ANCHOVIES IN OIL, AND SARDINES IN OIL.

*Report.*—Commended for good preparation and excellence of flavor.



## REPORTS ON AWARDS.

## 70. C. Maré, Nantes, France.

SARDINES IN OIL.

*Report.*—Commended for excellent and novel method of cans; very good flavor of product, with excellent oil.

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## 71. Caillebotte &amp; Damagnou, Paris, France.

SARDINES IN OIL, AND PICKLED FISH, AND CRAYFISH.

*Report.*—Commended for excellent preparation, with exceeding cheapness.

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## 72. Maille &amp; Tandeau, Paris, France.

ANCHOVIES IN OIL ON GLASS.

*Report.*—Commended for excellent preparation; fish of the choicest quality.

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## 73. Terrier Sr., Belle-Ile-sur-Mer, France.

ROUGETS IN OIL, AND TUNNY IN OIL.

*Report.*—Commended for great excellence in preparation, and neatness in form and construction of tin cases.

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## 74. Chr. Aug. Thorne, Moss, Norway.

SALMON IN OIL, PRESERVED LOBSTER, AND ANCHOVIES.

*Report.*—Commended for good preparation.

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## 75. Nicolas Mandado &amp; Sons, Aldan, Pontevedra, Spain.

PILCHARDS, SALTED AND PRESSED.

*Report.*—Commended for very good preparation, the product exposed to the warm weather having remained perfectly sound.

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## 76. Wm. Nordrock, Christiania, Norway.

ANCHOVIES.

*Report.*—Commended for very good preparation.

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## 77. Nicholas of Prevesa, Epirus, Turkey.

BOTARGO (MADE OF MULLET ROE).

*Report.*—Commended for excellence of taste and good method employed in its preservation.

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## 78. Nieuwenhuiss, Jr., &amp; Co., Amsterdam, Netherlands.

SMOKED SALMON AND BOILED SALMON.

*Report.*—Commended for very good preparation and fine flavor.

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## 79. Jose Antonio de Oliveira &amp; Co., Lisbon, Portugal.

SARDINES RAVIGOTE, WITH OIL AND SAUCE, AND IN OIL.

*Report.*—Commended for very good preparation.

## 80. Francisco Otero, Pontevedra, Spain.

PILCHARDS SALTED AND PRESSED IN TUBS.

*Report.*—Commended for very excellent preparation.

## 81. Oregon Packing Co., Portland, Oregon, U. S.

PRESERVED FISH (SALMON).

*Report.*—Commended for good flavor and soundness.

## 82. Portland Packing Co., Portland, Me., U. S.

CANNED MACKEREL AND CANNED LOBSTER.

*Report.*—Commended for very excellent preparation.

## 83. Carl E. Ronneberg &amp; Sons, Aalesund, Norway.

COD SOUNDS, SALTED AND DRIED COD, AND COD TONGUES.

*Report.*—Commended for the great excellence of preparation. The Judges would call special attention to the fine quality of the sounds and tongues.

## 84. Romero &amp; Ferrin, Coruña, Spain.

BOGAS IN OIL AND TOMATOES.

*Report.*—Commended for good preparation and fine flavor.

## 85. Nicholas Phaptopovlo, St. Petersburg, Russia.

CAVIAR.

*Report.*—Commended for good preparation.

## 86. A. Rosing's Widow, Christiania, Norway.

BISCUITS OF FISH MEAL.

*Report.*—Commended as of good preparation and very useful.

## 87. Royal Swedish Commission, Stockholm, Sweden.

BLEKINGE, SALTED GOTTLAND HERRING, EELS, AND COD, DRIED COD AND LING, PICKLED SPRATS; NETS, AND MODELS OF BOATS.

*Report.*—Commended for general excellence as a collective exhibit.

## 88. Fernando Rodrigues &amp; Nephew, Lisbon, Portugal.

CONGER EEL IN OIL, HAKE IN OIL, LAMPREY IN OIL, SOLES IN OIL, AND OYSTERS IN SAUCE.

*Report.*—Commended for remarkable excellence of preparation.

## 89. João Setubal, Lisbon, Portugal.

SOLES IN SAUCE AND OIL, WHITING IN SAUCE, AND CACHUCHO IN OIL.

*Report.*—Commended for general excellence and particularly good preparation.

## REPORTS ON AWARDS.

## 90. Kaitaku-Shi, Tokio, Japan.

SALMON SMOKED IN BAGS.

*Report.*—Commended for good preparation.

## 91. Filippo Stiassi, Bologna, Italy.

EELS IN PICKLE.

*Report.*—Commended for excellent preparation and fine flavor.

## 92. Widow of J. W. Suiri &amp; Son, Rotterdam, Netherlands.

HERRINGS MARINÉE, AND SOLES FRIED IN OIL

*Report.*—Commended for good preparation.

## 93. H. Chr. Strommer, Svovlvor, Norway.

WHITE CAVIAR.

*Report.*—Commended for very good preparation and excellence.

## 94. Sciaccaluga &amp; Co., Calbuco, Chili.

PREPARED FISH AS FOOD.

*Report.*—A large and general exhibit of fish, oysters, crabs, sea-weed, in oil, vinegar, and sauce, all of them excellent. The preparations were neatly put up, and all sound and of good flavor.

## 95. Alexander Schultz, Astrakhan, Russia.

ISINGLASS, CAVIAR, AND VIAZIGA.

*Report.*—Commended for good preparation and general excellence.

## 96. Mrs. Gina Smith, Christiania, Norway.

ANCHOVIES.

*Report.*—Commended for great excellence in preparation.

## 97. Stavanger Preserving Co., Stavanger, Norway.

FISH CAKES AND LOBSTERS.

*Report.*—Commended for general excellence, good flavor, and neat construction of cans.

## 98. Antonio Topich, Lissa, Dalmatia, Austria.

SARDINES IN OIL.

*Report.*—Commended for good preparation.

## 99. Mrs. Rina Tellefsen, Christiania, Norway.

ANCHOVIES.

*Report.*—Commended for excellence of preparation and good flavor.

## 100. T. Doyle, Halifax, Nova Scotia.

TONGUES, SOUNDS, HERRINGS, AND MACKEREL.

*Report.*—Commended for excellence of preparation, the product, in barrels, having kept sweet and in a sound condition during an exceptionally hot summer.

**101. William Underwood, Boston, Mass., U. S.**

CANNED LOBSTER, CANNED MACKEREL, CLAMS, AND FRESH COD.

*Report.*—Commended for exceeding excellence of preparation, the products being of fine flavor and in good shape.

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**102. Vicente Riego, Vivero, Lugo, Spain.**

PILCHARDS IN SALT, AND SARDINES.

*Report.*—Commended for good preparation, and remarkable for their cheapness.

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**103. Varzea & Coelho, Oporto, Portugal.**

SALMON IN OIL, ROACH IN OIL, SHAD IN OIL, HAKE IN OIL, RODOVALHO IN OIL, LAMPREY IN OIL, STURGEON, AND CODFISH.

*Report.*—A general exhibit of various kinds of fish in oil. Commended for excellent preparation. Contents of tin boxes sweet and sound, with fine character of oil.

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**104. Joanna Balbina Romao, Aveiro, Portugal.**

PICKLED TAEBAS, PICKLED COCKLES, PICKLED SOLES, PICKLED EELS, AND PICKLED MUSSELS.

*Report.*—Commended for very great excellence. The exhibit is particularly to be recommended for the method of canning, the boxes being on tin and inclosed in wood, giving greater security for transportation.

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**105. Andrews & Co., Halifax, Nova Scotia.**

CANNED LOBSTER AND MACKEREL.

*Report.*—Commended for good preparation.

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**106. Brazilian Commission, Rio de Janeiro, Brazil.**

TURTLE OIL WITH TURTLE BUTTER.

*Report.*—Commended for very sound and sweet preparation.

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**107. Chibucto Packing Co., Halifax, Nova Scotia.**

CANNED LOBSTER.

*Report.*—Commended for excellence in preparation.

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**108. John Merriman, Cape Town, Cape of Good Hope.**

PRESERVED CRAYFISH.

*Report.*—Commended for good preparation.

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**109. R. B. Noble, Richibucto, New Brunswick.**

CANNED LOBSTER.

*Report.*—Commended for good preparation.

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**110. Benj. J. M. Carley, New York, N. Y., U. S.**

PRESERVED OYSTERS, SPECIMENS OF OYSTERS AND CLAMS.

*Report.*—An exhibit of live oysters and clams, and of the shells of the various kinds found on the east coast of the United States.

**111. Miguel Cetrofe, Coruña, Spain.**

MUSSELS IN OIL.

*Report.*—Commended for very excellent preparation.**112. Louis McMurray & Co., Baltimore, Md., U. S.**

LUNCH OYSTERS AND CANNED OYSTERS.

*Report.*—Commended for general excellence, sound condition of oysters, and flavor.**113. John L. Shriver & Bros., Baltimore, Md., U. S.**

PICKLED OYSTERS IN RESERVOIR FRUIT JARS.

*Report.*—Commended for very excellent preparation.**114. A. B. De Frece, New York, N. Y., U. S.**

MOTHER OF PEARL.

*Report.*—Commended for good work and taste in design.**115. Mrs. M. E. Gardner, Nassau, Bahamas.**

SHELL WORK.

*Report.*—Commended for excellence of design.**116. F. C. Kiergaard, Philadelphia, Pa., U. S.**

FISH SCALE JEWELRY.

*Report.*—Commended for excellence of design.**117. Dr. C. A. Miller, Cincinnati, Ohio, U. S.**

MOTHER OF PEARL (UNIOS).

*Report.*—A good exhibit of ornamental shells.**118. Mrs. C. E. Mott, Jacksonville, Fla., U. S.**

SHELL WORK.

*Report.*—Commended for good work and artistic design.**119. Mrs. S. E. Robertson, Nassau, Bahamas.**

SHELL WORK.

*Report.*—Commended for good design and excellence of work.**120. David H. Schaffer, Mount Lookout, Cincinnati, Ohio, U. S.**ORNAMENTAL JEWELRY FROM THE NATIVE PEARL OF THE SHELLS (OR UNIO) OF THE  
MIAMI RIVER.*Report.*—Commended for good work and tasteful designs.**121. Government of Bermudas.**

SHELLS, CORALS, SPONGES, SEA FANS, AND ECHINODERMS.

*Report.*—Commended for variety and excellence of specimens exhibited.

## 122. Banaïot &amp; Bros., Bethlehem, Turkey.

MOTHER OF PEARL WORK.

*Report.*—Commended for careful work and good design.

## 123. N. E. Atwood, Provincetown, Mass., U. S.

FISH OILS.

*Report.*—Commended for general character of exhibit, representing all varieties of oil from fish, viz., oils of cow-fish, pollock, squid, menhaden, thrasher shark, cod, harbor seal, blackfish, jaw porpoise, head of blackfish, liver of dogfish, cusk, cramp-fish, mackerel, shark, haddock, and horse-mackerel.

## 124. American Whip Co., Westfield, Mass., U. S.

WHALEBONE.

*Report.*—Commended for good workmanship.

## 125. Cape Ann Isinglass Co., Rockport, Mass., U. S.

ISINGLASS.

*Report.*—Commended for good preparation.

## 126. Captain Caleb Cook, Provincetown, Mass., U. S.

FISH OILS AND VARIOUS OILS OF GRAMPUS AND BLACKFISH, MELLON BLUBBER OF BLACK-FISH AND GRAMPUS.

*Report.*—Commended for variety of products from various fish, with excellent preparation, and especially adapted for lubricating fine machinery.

## 127. Domingos José d'Almeira, Pará, Brazil.

ISINGLASS (TWO PREPARATIONS, THE BLADDER AND IN FINE CUTTINGS).

*Report.*—Commended for good preparation.

## 128. Ewing &amp; Wise, Victoria, British Columbia.

ISINGLASS.

*Report.*—Commended for good preparation.

## 129. Haven, Williams, &amp; Co., New London, Conn., U. S.

FISH OIL.

*Report.*—Commended for good preparation and variety of products, viz., oils from hump-back whale, sea-elephant, right whale, and sulphur-bottom whale.

## 130. Gloucester Isinglass Co., Gloucester, Mass., U. S.

ISINGLASS AND FISH GLUE.

*Report.*—Commended for great excellence; specially worthy of notice as bringing into use the skins of the codfish, making a valuable product.

## 131. Howe &amp; French, Boston, Mass., U. S.

RIPLEY AMERICAN ISINGLASS.

*Report.*—Commended for good preparation.

## 132. Imperial Board of Agriculture, Industry, and Commerce, Tokio, Japan.

FISH SKINS.

*Report.*—Commended for beautiful preparation of sturgeon and shark skins

## 133. Gustav Mueller, Chicago, Ill., U. S.

ISINGLASS (TWO KINDS, COMMON AND PREPARED).

*Report.*—Commended for great excellence and purity. This product is quite equal to the foreign product.

## 134. C. Norwood &amp; Son, Ipswich, Mass., U. S.

ISINGLASS.

*Report.*—Commended for very great excellence and purity.

## 135. Svend Foyn, Tonsberg, Norway.

WHALE OIL (DIFFERENT KINDS).

*Report.*—Commended for good preparation.

## 136. E. E. Small, Provincetown, Mass., U. S.

FISH OILS.

*Report.*—Commended for good preparation and variety of oils exhibited, viz., oils from head of grampus, blackfish, head of blackfish, liver of cramp-fish, porpoise, liver of porpoise, liver of pollock, haddock liver, hake liver, saw-fish, Russian grampus, snuffer, crude oil from menhaden, and sperm oil.

## 137. Nicholas Sokolof, St. Petersburg, Russia.

ISINGLASS FROM CARP, STURGEON, AND VIAZIGA, AND EDIBLE SUBSTANCE FROM THE SPINAL CORD OF THE STURGEON.

*Report.*—Commended for good preparation and general excellence.

## 138. Joseph F. Tobin, New York, N. Y., U. S.

WHALEBONE.

*Report.*—Commended for excellence of collective display and variety of exhibit; also for accuracy in the shape and form of the manufactured whalebone.

## 139. Walter G. I. Wheeler, New York, N. Y., U. S.

ISINGLASS.

*Report.*—Commended for excellence of product and neatness of preparation.

## 140. E. F. Gilbert, Jacksonville, Fla., U. S.

ALLIGATOR IVORY.

*Report.*—Commended for bringing into use a valuable substance, and for good workmanship.

## 141. Marvin Brothers &amp; Bartlett, Portsmouth, N. H., U. S.

COD LIVER OIL.

*Report.*—Commended for good preparation.

## 142. Conroy, Bissett, &amp; Malleson, New York, N. Y., U. S.

ARTIFICIAL FLIES, BASS LINES, FINE RODS, REELS, AND ARTIFICIAL BAIT.

*Report.*—Commended for excellence of manufacture and great variety of fishing implements.

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## 143. Christiania Sail-Cloth Manufactory, Christiania, Norway.

FISHING THREAD (YARN AND TWINE) AND SEINE NETS.

*Report.*—Commended for excellence of manufacture.

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## 144. J. F. Carter, Gloucester, Mass., U. S.

FISHERMEN'S OIL CLOTHING.

*Report.*—Commended for great excellence of make and cut, being light and serviceable.

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## 145. J. W. Dresser, Castine, Me., U. S.

FISHING LINES.

*Report.*—Commended for strength and good material.

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## 146. S. Ellwell, Jr., Gloucester, Mass., U. S.

FISHING KNIVES.

*Report.*—Commended for good shape, make, and temper.

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## 147. Ths. Erichsen, Bergen, Norway.

FISH HOOKS.

*Report.*—Well-made hooks for general fishing.

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## 148. George Fox, Jr., Philadelphia, Pa., U. S.

TROUT FLY RODS.

*Report.*—An excellent rod, showing care in construction, with neat workmanship.

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## 149. J. L. Graves, Springfield, Mass., U. S.

FISHING RODS (HOLLOW).

*Report.*—Commended for lightness and strength.

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## 150. Bradford &amp; Anthony, Boston, Mass., U. S.

ANGLERS' IMPLEMENTS AND FISHING TACKLE.

*Report.*—An exhibit, in exhaustive variety, of anglers' apparatus, especially of hooks, lines, rods, and artificial flies, all of American make and of the best quality. Most of the flies artificially made were accompanied by a drawing of the original insect from which they were modeled.

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## 151. Arntzenius, Jannink, &amp; Co., Goor, Overijssel, Netherlands.

NETS.

*Report.*—A fine collection of well-made nets.



## 152. J. &amp; S. Allen, Walpole, Mass., U. S.

## FISHING LINES.

*Report.*—Commended for strength, and care taken in manufacture.

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## 153. American Net and Twine Co., Boston, Mass., and New York, N. Y., U. S.

## NETS (SEINES, TRAMMEL-NETS, GILL-NETS, AND PURSE-NETS) AND LINES.

*Report.*—As a collection, it is of the most complete character, and is excellent as to material and as to knotting. They are among the best of machine-made nets exhibited.

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## 154. C. G. Atkins, Bucksport, Me., U. S.

## FISH-WAYS.

*Report.*—Commended as exhibiting, in a collective form, the general construction of fish-ways, with several of his own invention, adapted to peculiar circumstances.

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## 155. Charles Belbin, Md., U. S.

## MODELS OF OYSTER PUNGY, WITH MODEL OF OYSTER DREDGE.

*Report.*—Commended as fully illustrating the construction of the peculiar boat used in Maryland, and the apparatus used in dredging.

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## 156. Jonathan Buck, Harwich, Mass., U. S.

## FISHERMEN'S BOOTS.

*Report.*—Commended for good make and sound material.

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## 157. James Buchanan, Glasgow, Scotland.

## FISH HOOKS.

*Report.*—Commended for excellence of make, good shape, and temper.

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## 158. J. T. Buell, Whitehall, N. Y., U. S.

## TROLLING SPOONS.

*Report.*—Commended for general excellence and good workmanship.

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## 159. C. C. Brand, Norwich, Conn., U. S.

## WHALING GUN, WITH BOMB PROJECTILE.

*Report.*—Commended for efficiency in capturing whales with the minimum of labor, and in taking species, as the finback, which are scarcely to be mastered by the ordinary harpoon.

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## 160. Board of Commerce, Aalesund, Norway.

## FISHING TACKLE, LINES AND NETS.

*Report.*—A very good and complete collection of fishing tackle for cod and other fish; also nets and fine models of fishing boats.

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## 161. W. D. Chapman, Theresa, N. Y., U. S.

## TROLLING BAIT.

*Report.*—Commended for good workmanship.

**162. Gloucester Fishing Exhibit, Gloucester, Mass., U. S.**

GENERAL COLLECTION OF FISHING IMPLEMENTS, WITH MODELS OF BOATS.

*Report.*—Commended for very great excellence as to character of exhibit and its comprehensiveness, the whole history of the Gloucester fisheries finding in this collection a thorough illustration.

**163. Falck Ytter, Christiania, Norway.**

FISHING SLED, WITH IMPLEMENTS.

*Report.*—Commended for excellence of make.

**164. S. P. Hedges, Greenport, Long Island, N. Y., U. S.**

FISH SPEAR.

*Report.*—Commended for good work and serviceable shape.

**165. Hurdal Biri, Hadeland, and Håvicks Glass-Works, Christiania, Norway.**

GLASS FLOATS.

*Report.*—Well-made articles, and a useful application of glass to the uses of the fisheries.

**166. Fagerheim Mechanical Net Co., Bergen, Norway.**

NETS AND SEINES.

*Report.*—Commended as very well constructed, double knotted, and of good material.

**167. W. E. Hooper & Sons, Baltimore, Md., U. S.**

NETS OF VARIOUS KINDS.

*Report.*—Exceedingly well made nets.

**168. John Krider, Philadelphia, Pa., U. S.**

SPLIT BAMBOO RODS.

*Report.*—Commended for excellent workmanship; constructed of split bamboo; enamel inside.

**169. First Japanese Manufacturing and Trading Company, Tokio, Japan.**

FISHING TACKLE.

*Report.*—A general exhibit of various kinds of tackle and nets used in Japan. These articles show great skill in making, and seem well adapted to the purposes for which they are intended.

**170. Jens O. Dahl, Havoen, Norway.**

COD AND HERRING NETS, COD LINES AND GEAR.

*Report.*—A good collection of nets for cod and herring, with lines.

**171. Kelsey & Hosmer, Sandusky, Ohio, U. S.**

FISH-DRESSING MACHINE.

*Report.*—Commended for facilitating the operation of cleaning and dressing fish; worthy of mention as an ingenious mechanical device.

## 172. H. L. Leonard, Bangor, Me., U. S.

FISHING RODS.

*Report.*—Commended for excellence of workmanship.

## 173. Alexander McCurdy, Gloucester, Mass., U. S.

FISHERMEN'S KNIVES.

*Report.*—Commended for good workmanship and material.

## 174. A. E. Maas, Scheveningen, Netherlands.

NETS AND TRAWL LINES, MODELS OF BOATS.

*Report.*—Very well made trawl net.

## 175. Sara J. McBride, Mumford, N. Y., U. S.

ASSORTMENT OF FLIES.

*Report.*—Commended for exceedingly neat work, with solidity of construction.

## 176. G. H. Mansfield &amp; Co., Canton, Mass., U. S.

ASSORTMENT OF BRAIDED FISHING LINES.

*Report.*—An exhibit of braided fishing lines, excellent as to material and workmanship, exhibiting strength and suppleness, and covered with a protecting composition.

## 177. Massachusetts Marine Exhibition, U. S.

BOATS FOR FISHERMEN AND FISHING VESSELS (MODELS).

*Report.*—A fine collection.

## 178. Maryland Centennial Commission, U. S.

MODEL OF FISH-HATCHING HOUSE, MODELS OF VARIOUS BOATS USED IN THE MARYLAND FISHERIES, OYSTER DREDGES, FISHING BATTERY, SPECIMENS OF FISH, AND MODEL OF THE FERGUSON HATCHING JAR IN EXISTENCE AT DRUID HILL.

*Report.*—A collective exhibit of Maryland fisheries and fish-culture, including the most recent applications for the purpose.

## 179. E. B. &amp; F. Macy, New Bedford, Mass., U. S.

WHALING GEAR.

*Report.*—Commended as illustrating the general character of implements used in whale fishing.

## 180. Thaddeus Norris, Philadelphia, Pa., U. S.

FISHING RODS.

*Report.*—Commended for very great excellence in manufacture, these rods combining strength with elasticity and lightness.

## 181. Norwegian Patented Twine Manufactory, Kraasby Brothers, Aalesund, Norway.

FISHING LINES AND SNOODS.

*Report.*—Commended as very well made, of great strength, and reasonable price.

## 182. C. F. Orvis &amp; Co., Manchester, Vt., U. S.

## THE ORVIS REEL, WITH OR WITHOUT CLICK.

*Report.*—This reel is simple in construction and neat in workmanship. Two points of advantage are its lightness, and, being perforated, the line dries on it rapidly.

## 183. Pedro Aliet, Gracia, Barcelona, Spain.

## NETS MADE BY MACHINERY.

*Report.*—Remarkably good machine-made nets.

## 184. William Henry Ryder, Birmingham, England.

## FISHING REELS AND GENERAL FISHING TACKLE, WITH RODS, ETC.

*Report.*—Commended for general excellence with cheapness.

## 185. A. B. Shipley &amp; Son, Philadelphia, Pa., U. S.

## ARTIFICIAL FLIES, RODS, REELS, AND GENERAL ASSORTMENT OF FISHING TACKLE.

*Report.*—A very full and well made assortment of fishing tackle. The exhibitors also show a fine collection of hooks, as agents of John James & Sons, of London.

## 186. D. Scribner, St. John, New Brunswick.

## RODS FOR CATCHING SALMON.

*Report.*—Commended as well made and serviceable.

## 187. W. W. Smith, Provincetown, Mass., U. S.

## FISHING BOAT FITTINGS.

*Report.*—Commended for strength and lightness and excellence of make.

## 188. W. H. Young, Philadelphia, Pa., U. S.

## TROLLING SPOONS.

*Report.*—Commended for variety of exhibit and general excellence.

## 189. William T. Wroten, Baltimore, Md., U. S.

## MODELS OF OYSTER BOATS.

*Report.*—Commended for neat workmanship and faithful representations of boats used in Chesapeake Bay for taking and transporting oysters, with models of apparatus used in the capture of oysters.

## 190. A. Voss, Gloucester, Mass., U. S.

## BAIT MILL.

*Report.*—A convenient method of preparing bait.

## 191. Charles E. Wheeler, Farmington, Me., U. S.

## SPLIT BAMBOO RODS.

*Report.*—Salmon trout rods, split bamboo, enamel outside, good workmanship.

192. **White Manufacturing Co., Bridgeport, Conn., U. S.**

## FISHING LAMPS.

*Report.*—Commended for serviceable form and general excellence.

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193. **Wilcox, Crittenden, & Co., Middletown, Conn., U. S.**

## MARINE HARDWARE.

*Report.*—A complete exhibit of fishing boat fittings and fishermen's outfit and knives.

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194. **James D. Brewer, Muncy, Pa., U. S.**

## FISH-WAYS.

*Report.*—An exhibit illustrating the construction of fish-ways of different forms, on the Brewer pattern.

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195. **Johnson & Young, Boston, Mass., U. S.**

## LOBSTER FACTORY.

*Report.*—Commended as illustrating the method of steaming and preparing the lobster.

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196. **Mrs. J. H. Slack, Bloomsbury, N. J., U. S.**

## COMBINATION HATCHING BOXES.

*Report.*—An excellent arrangement for hatching large quantities of eggs in a small space.

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197. **W. H. Cook & Co., New Bedford, Mass., U. S.**

## WHALING GEAR.

*Report.*—Commended as a collective display showing the implements used in the capture of whales.

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198. **Mechanical Net Manufacturing and Weaving Stock Co., Itzehoe, Germany.**

## NETS (LINEN AND COTTON).

*Report.*—Commended as being well made and of good material.

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199. **Smithsonian Institution (T. W. Smillie), Washington, D. C., U. S.**

## COLLECTIVE EXHIBIT OF PHOTOGRAPHS OF AMERICAN FOOD FISHES.

*Report.*—Commended for great comprehensiveness of exhibit, and excellence, illustrating the fish of America.

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200. **Smithsonian Institution (Joseph Palmer), Washington, D. C., U. S.**

## CASTS OF AMERICAN FISHES IN PLASTER OF PARIS AND PAPIER-MACHÉ.

*Report.*—Commended for the most faithful representation of the fish on the American coast. These casts, which number four hundred and eight, constitute the largest and most perfect collection heretofore made as a perfect illustration of the shape, form, and appearance of American fish.

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201. **Smithsonian Institution (J. H. Richard), Washington, D. C., U. S.**

## COLLECTION OF WATER-COLOR SKETCHES AND OIL PAINTINGS (ON PLASTER CASTS) OF FISH OF NORTH AMERICA.

*Report.*—Commended for exceeding truthfulness in the coloring of the plaster casts of fish, and for the painstaking labor and artistic effect.

## SIGNING JUDGES OF GROUP V.

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The figures annexed to the names of the Judges indicate the reports written by them respectively.

JOAKIM ANDERSSON, 1, 2, 3, 4, 8, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 161, 162, 163, 164, 165, 166, 167, 169, 171, 172, 173, 174, 177, 178, 179, 180, 181, 184, 187, 188, 189, 190, 192, 193, 194, 195, 197, 198, 199, 200, 201.

T. B. FERGUSON, 5, 6, 7, 9, 13, 147, 148, 160, 168, 170, 175, 176, 182, 183, 185, 186, 191, 196.

# SUPPLEMENT TO GROUP V.

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## REPORTS OF JUDGES ON APPEALS.

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### JUDGES.

JOHN FRITZ, Bethlehem, Pa.  
EDWARD CONLEY, Cincinnati, Ohio.  
CHARLES STAPLES, JR., Portland, Me.  
BENJ. F. BRITTON, New York City.  
H. H. SMITH, Philadelphia, Pa.

COLEMAN SELLERS, Philadelphia, Pa.  
JAMES L. CLAGHORN, Philadelphia, Pa.  
HENRY K. OLIVER, Salem, Mass.  
M. WILKINS, Harrisburg, Oregon.  
S. F. BAIRD, Washington, D. C.

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#### 1. John Shields, Boston, Mass., U. S.

##### ARTIFICIAL FLIES.

*Report.*—Commended as an extremely complete collection of artificial flies for taking salmon, bass, trout, shad, etc., embracing about four hundred varieties, made in the most artistic manner from undyed feathers, and copied from natural flies with great accuracy, as shown by accompanying colored drawings of the originals.

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#### 2. Frank N. Clark, Northville, Mich., U. S.

##### APPARATUS FOR HATCHING EGGS OF THE SALMON FAMILY.

*Report.*—Commended for capacity for hatching a great number of fish eggs in a very small space.

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#### 3. E. A. Brackett, Winchester, Mass., U. S.

##### FLOATING SHAD HATCHING BOX.

*Report.*—Commended for novelty and adaptation to the purpose intended.

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#### 4. Seth Green, Rochester, N. Y., U. S.

##### SHAD HATCHING BOX.

*Report.*—Commended for adaptation to the purpose of hatching shad economically and on a very large scale.

5. Camilo Fabra, Barcelona, Spain.

FISHING NETS.

*Report.*—Commended for excellence, variety, and adaptation to the purpose intended.

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SIGNING JUDGE OF SUPPLEMENT TO GROUP V.

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The figures annexed to the name of the Judge indicate the reports written by him.

SPENCER F. BAIRD, 1, 2, 3, 4, 5.





## GROUP VI.

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TIMBER, WORKED LUMBER, PARTS OF BUILDINGS,  
FORESTRY.

## GROUP VI.

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### JUDGES.

#### AMERICAN.

WM. H. BREWER, Yale College, New Haven, Conn.

J. M. BENNETT, Weston, Lewis County, W. Va.

J. S. NEWBERRY, Columbia College, New York.

#### FOREIGN.

JOHN R. WEST, Chili.

RODRIGUES DE VASCONCELLOS, Portugal.

JOSÉ DE SALDANHA, Brazil.

The following named Judges were temporarily assigned from other groups to assist in the examination of the classes attached to their respective names.

W. H. CHANDLER.—Raw rubber.

FERMIN ROSILLO.—Products of the Philippine Islands.

## GROUP VI.

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### TIMBER, WORKED LUMBER, PARTS OF BUILDINGS, FORESTRY.

CLASS 600.—Timber and trunks of trees, entire or in transverse or truncated sections, with specimens of barks, leaves, flowers, seed-vessels, and seed.

Ship timber—masts, spars, knees; longitudinal sections of trees; railway ties; planks, boards, rough and planed; shingles, lath, staves, etc.

Timber and lumber prepared in various ways to resist decay and combustion, as by injection of salts of copper and zinc, etc.

CLASS 601.—Ornamental woods used in decorating and for furniture, such as mahogany, oak, etc., and veneers of rosewood, ebony, walnut, maple, madroño, and other woods.

CLASS 602.—Dye-woods, barks, and galls for coloring and tanning. (See also Group III.)

CLASS 603.—Gums, resins, caoutchouc, gutta-percha, vegetable wax.

CLASS 604.—Lichens, mosses, fungi, pulu, ferns.

CLASS 605.—Seeds, nuts, etc., for food and ornamental purposes.

CLASS 606.—Forestry—Illustrations of the art of planting, managing, and protecting forests. Statistics.

CLASS 227.—Manufactured parts of buildings—doors, mouldings, sash, blinds, mantels, etc.

Field and garden seeds.



# GENERAL REPORT

OF THE

## JUDGES OF GROUP VI.

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INTERNATIONAL EXHIBITION.  
PHILADELPHIA, November 7, 1876.

PROF. F. A. WALKER, *Chief of the Bureau of Awards:*

SIR,—In accordance with a communication received from you, dated June 29, 1876, containing a resolution of the Executive Committee of the United States Centennial Commission relative to the preparation of reports of a general character from the several groups, summarizing the Exhibition in each important line of production or manufacture, I have the honor to present the inclosed report.

Respectfully your obedient servant,

WM. H. BREWER,  
*Chairman of Group VI.*

## GROUP VI.

### TIMBER, WORKED LUMBER, PARTS OF BUILDINGS, FORESTRY.

BY WM. H. BREWER.

In the *Grouping for the Judges' Work*, eight classes were referred to Group VI., arranged in eleven sub-classes, each of which contained several kinds of objects. To these were afterwards added several other sub-classes, in whole or in part. No statistics have been prepared of the actual number of exhibits. For our present purpose, the objects originally referred to the group may be considered in four great divisions, viz. :

1. The crude products of forests, trees, and shrubs, including certain scientific and illustrative collections, lumber, timber, woods, and various economic or commercial raw material. This excludes cultivated fruits, but includes the woods of cultivated fruit-trees where used for economic purposes.
2. Certain manufactured parts of buildings and structures made of wood, as prepared for market, and specimens of carpentry.
3. Timber and lumber prepared to resist combustion and decay.
4. Illustrations of the art and science of Tree-Planting, Tree-Culture, and Forestry, also literature, maps, and statistics relating to Forestry.

A careful classification and elaboration of these four orders into divisions and subdivisions would give about fifty ultimate parts or groups, each of which may consist of the products of few or of many species of trees. We shall consider the four principal divisions.

#### I.—WOODS, TIMBERS, LUMBER, AND RAW FOREST-PRODUCTS.

Wood is one of the few prime necessities of society, and is the raw material for a greater variety of manufactures than any other natural product. Considered as a whole, it is a product of every habitable country, with the very limited exception of a few desert and arctic regions inhabited by savages. The kinds and species vary with the

geographical locality, the extremely useful timbers being for the most part the product of regions with a temperate climate, where the forests are more generally composed of "social" or "gregarious" species; and the very ornamental woods coming largely from tropical countries, where the number of woody species is much greater but the social or gregarious fewer. While the actual number of useful species is as great or greater in the tropics than in temperate climates, the economic production is less, because of a smaller local demand. As a whole, the harder, heavier, more highly-colored, and more fragrant woods are from the tropics, and these regions furnish a larger variety of such other useful raw materials as barks, gums, medicinal extracts, etc.

In this general notice no distinction will be drawn between the woods of Class 600, which relate to museum collections and the woods of construction, and of Class 601, which relate to ornamental and furniture woods. No such distinction was drawn in the exhibits, except in a few instances, neither is the distinction drawn in commerce except as it is caused by production and transportation, nor is it found in nature. In the Ohio Valley, or farther west, the black-walnut is used by one generation for the commonest purposes, even for farm fence-rails and cheap fuel, and with the next generation it becomes the most fashionable and costly of native ornamental woods. Chestnut and swamp-ash are other familiar examples at home; while any commercial foreign wood becomes "ornamental" in almost the same ratio in which it becomes rare or costly.

The display of woods, timber, and lumber in the Exhibition was very large. The larger number of exhibits were what we will for convenience call museum exhibits, that is, collections of specimens of woods in other form than as actual timber, lumber, or fuel. Many of them were parts of larger collective exhibits containing woods, other forest-products, timbers, lumber, veneers, fuels, fibres, gums, resins, barks, etc. These usually represent some county or district. One hundred and thirty-four nations, states, territories, colonies, provinces, districts, or municipalities were represented in Classes 600 and 601, one hundred and four of which were represented officially by collections illustrating their local woods by what are here called museum specimens. These were shown through a variety of agencies,—by general or local governments, departments of governments, surveys, local committees, local boards, societies, associations, botanic gardens, universities, schools, and persons acting in an official capacity. The actual number of such collections cannot be given exactly, as several local collections were often combined into larger ones representing a state



or nation. Besides the official exhibits of woods, there were many, similar in character, by private exhibitors, the whole number of exhibits amounting to four hundred or more collections, containing an estimated aggregate of at least fifteen or twenty thousand specimens. Only a few collections of this large number can be here considered, and all the crude forest-products as well as museum collections will be considered together. Under the general terms "timber" and "lumber" are included all forms of merchantable woods, other than fuel and museum specimens, as they come to market, whether as logs in the rough, scaled or hewn, or pieces sawn, split, riven, cut, sliced, or shaved, all of which forms were found in the Exhibition.

Neither the number of specimens nor the number of species in a collection is any index of its economic importance, as some countries are naturally vastly richer in woody species than others, without a corresponding difference in the richness of their respective timber resources. Thus, the New World is richer in tree-species than the Old. We have, in the United States, over three hundred species of indigenous trees which grow to a height of thirty feet or more; while in the British Isles there are, according to Lindley, but twenty-nine; in France, according to Michaux, thirty (other French authorities say thirty-four); and in Germany scarcely more. We see from this how it may be that an imperfect collection of the native woods of a single county in the United States might contain more species than a complete collection of the native woods of all Europe. With certain island provinces this fact may be still more forcibly seen, where immense economic interests may centre in a very limited number of native species of woods. With this introduction we pass to some of the features of the Exhibition.

The United States had the largest and most complete collection of woods, so far as regards species, in the Exhibition. It was exhibited by the Department of Agriculture, and brought together and arranged under the direction of the botanist of the Department, Dr. George Vasey. America has long been described by geographers and naturalists as the wooded continent, distinguished for the luxuriance and extent of its forests and the number of its arboreal species. Of the three or four hundred species of trees of thirty feet in height or more, about one hundred and twenty species attain a height of one hundred feet, twelve of two hundred feet, and five or six a height of three hundred feet or more. There are at least three forestal floras, each rich in tree-species, and the collection contained nearly every indigenous species known to the botanist as occurring within the United

States, and also some of the larger shrubs. Many of the species were shown in several geographical varieties. Most of them were accompanied with foliage, flowers, and fruit. The printed annotated catalogue shows four hundred and nineteen species, a few of which, however, are not strictly trees, but rather important shrubs.

The United States Naval Department exhibited ship-timber. Some pieces artificially bent were especially interesting.

Except as represented in the general collection above spoken of, many of the States and Territories had no exhibits of crude forest-products whatever. Twenty-one States and Territories had such exhibits, however, and seventeen had some kind of official exhibit of native woods, timbers, or lumber. The others were represented only by private exhibits, and some of the States noted for their trees were entirely unrepresented.

From Delaware was a large collection, consisting of museum specimens appropriately labeled, also ship-knees and timbers, and many rough sections of trees, some of great size, all carefully labeled.

From Illinois were several collections, the largest and most nearly complete being that by the State Industrial University at Champaign. This consisted of nearly two hundred specimens, mostly named, many of them accompanied with notes on range, abundance, and size.

From Indiana appeared a collection of native woods in rough sections. It embraced only a part of the timber-species of the State, but some of them were of large growth and represented valuable timber-trees.

From Iowa was a collection of about one hundred and sixty catalogue numbers, some of the specimens of large growth, some undressed, others dressed, varnished, and finished to show adaptability for ornamental uses; also, cultivated woods.

Kansas had a large collection, mostly of cross-sections, especially interesting as showing the rate of growth of several species artificially planted. Of the indigenous growths, black-walnut, cottonwood, and sycamore were shown in cross-sections over five feet in diameter.

The State of Michigan, and the Agricultural College at Lansing, exhibited large and interesting collections of the woods of that State. They contained cross-sections, blocks, dressed and polished boards, miscellaneous pieces and arboreal curiosities, planks, and marketable lumber. The printed catalogue, by Prof. J. W. Beal, contained much information relative to the native woods of the State, made more interesting by the fact that at present this State brings more lumber to market than any other in the Union. In a list of dimensions of

native trees, twelve species were named with diameters of five feet and over, conspicuous among them being white-pine, six and a half feet; white-oak, eight and a third feet; cottonwood, ten feet; black-walnut and buttonwood, each eleven feet. There were also fine exhibits of lumber and of rough logs.

From Ohio was a private exhibit of white pine of great excellence; and from Wisconsin a considerable, but by no means complete, collection of woods. Some of the timber-trees of Wisconsin were finely shown.

The exhibit of West Virginia was relatively the fullest of any of the State collections. Local and county collections, museum specimens, and the contributions of many private persons were combined in one grand State exhibit under the direction and supervision of Mr. M. F. Maury, who prepared a printed description. The exhibit consisted of, 1st, about eighty species, all those known to be indigenous to the State, shown in beautiful museum specimens, arranged like large volumes in a library; 2d, sixty-three museum planks varnished and polished to show adaptability to furniture and ornamental work; 3d, sawn and split lumber; 4th, rough cross-sections to illustrate size of natural growth; 5th, veneers of several native species, both as prepared for market and in the finished work. Owing to the difficulty of transportation, the largest specimens intended for the Exhibition were ultimately left at home; but the following sixteen species were shown in sections of three to five feet diameter,—white-ash, beech, butternut, black-walnut, chestnut, white-elm, white-hickory, red-hickory, white-oak, red-oak, chestnut-oak, poplar, red-birch, sugar-maple, sycamore, and tulip-tree, and such valuable woods as locust, wild-cherry, sassafras, silver-maple, etc., of relatively large size.

The only considerable State exhibit of woods from the Pacific States was from Oregon; a portion of the specimens were especially impressive as exhibiting the gigantic size of some of the trees and the immense timber resources of the region. Thus, of yellow-fir (*Abies grandis*) two sections were shown taken from the same tree, the first six feet ten and a half inches in diameter exclusive of bark, taken "one hundred and thirty feet from the ground;" the other five feet ten inches, taken "two hundred feet from the ground," with the statement that the tree was three hundred and twenty-one feet high, fifteen and three-quarters feet in diameter at the butt, and that the timber of that species is "good for ship-building." A section of tide-land spruce (*Abies menziesii*), taken "ninety-eight feet from the ground," was six feet ten inches in diameter, and the tree is stated to have been three hundred and eighteen feet high, and sixteen feet in diameter at the

butt. With an exhibit of shingles made from this species is the statement, "This tree made 100 M. [100,000] shingles, and the branches and other parts not used in shingles made fifty-eight cords of wood." A section of Oregon red-cedar (*Thuja gigantea*), more than five feet in diameter, has the accompanying statement, that it was "taken out of the tree one hundred and eighteen feet above the ground and two feet seven inches from the centre" (that is, from one side, and not across the centre of the tree, and therefore showing much less than the actual diameter at that point), and that "the diameter of the tree was twenty-two feet, length of the tree three hundred and twenty-five feet." There were also exhibits illustrating great size in the original trees, with specimens of other timber and ornamental woods. Specimens of the Oregon maple (*Acer macrophyllum*) "burled," both in the rough and wrought, were exhibited to show its capability for ornamental uses, some of the latter having great beauty.

Of crude forest-products other than woods, lumber, and timber, very little was shown from the United States, except a few articles to be noticed later. We may here, however, speak of a collection of seeds of trees and shrubs of the United States, by Mr. Thomas Meehan, of Germantown, Pennsylvania. It purported to contain three hundred and fifty species, and is, so far as known to us, the fullest such collection yet exhibited.

In several of the State buildings a few of the woods native to the State were shown in construction.

#### ARGENTINE REPUBLIC.

The woods of the Argentine Republic were represented in about fifty collections, seventeen provinces being locally represented by official exhibits. The rich mass of material was exhibited as a whole, and embraced many hundreds of specimens in a variety of forms, sections rough and polished, and a great number of museum specimens illustrating every variety of grain and finish, accompanied with pictorial illustrations. With these was exhibited a rich and varied collection of other forest-products, such as gums, dye-woods, barks, fibres, etc.

#### BRAZIL.

From Brazil were about thirty collections of woods, twelve states or districts being officially represented through local committees or other official agencies. These, with some of the private collections, were arranged in the Exhibition so as to show the forest resources of the Empire as a whole. Many were large-sized museum specimens,

others in truncheons, sticks, planks, etc., and many of them polished to show their appearance when finished. Taken as a whole, they formed, perhaps, the most striking and attractive display of woods in the Exhibition. Large planks and boards, commercial woods, and woods used in the navy for ship-building, were also shown. The vast forests of the Amazon Valley have long been famous as the most extensive and luxuriant of the tropical forests of the world. The vast extent of the Empire, with its varieties of soil and climate, combined with the arboreal tendencies of American vegetation, have made this country especially rich in valuable woods and timbers, and a larger number of species of trees are known to botanists as indigenous to Brazil than to any other country. In the Exhibition over three hundred species were represented, including the many valuable species known to commerce, such as rose-wood, amaranth, satin-wood, etc. Professor José de Saldanha da Gama, of Rio de Janeiro, accompanied the collection with a printed catalogue of one hundred and seventeen of the more important species, with notes on their uses, their botanic names, etc., and in *Notes in regard to some Textile Plants of Brazil* is found much information on various bark-textiles. Dr. Nicolau J. Moreira, another member of the Brazilian Commission, in his *Historical Notes concerning the Vegetable Fibres*, etc., notices various other forest-fibres of the country. Besides the woods, there was a large and varied collection of other forest-products, such as barks, gums, resins, caoutchouc, wax, medicinal barks and herbs, etc., each accompanied with the botanic name, when known, of the tree or shrub yielding the product. There were several exhibits of crude caoutchouc of first quality. The export of this product, according to official statements, has exceeded ten million pounds, annually, for the past ten years.

#### GREAT BRITAIN.

The British Isles showed no raw forest-products, but the following British colonies or possessions were represented, either officially through local governments, institutions, or boards, or by private exhibitors, viz., Bahamas, Bermudas, British Columbia, British Guiana, Canada, Cape of Good Hope, Gold Coast, India, Jamaica, Mauritius, New Brunswick, New South Wales, New Zealand, Queensland, Straits Settlements, Seychelles, Trinidad, Tasmania, and Victoria. Some of these countries were richly represented, others but meagerly, but the interest of the exhibits bore but slight relation to the actual size of the collections. Some of these represented limited island areas, with but few species of trees, others some of the most celebrated

forests of the globe, so that a small collection might be very full and represent great economic interests, while a vastly more striking one might but meagerly represent the actual forest resources of its locality.

The nineteen colonies or possessions may, for our uses, be thrown into seven geographical groups, viz.:

- a.* British North America.
- b.* The Atlantic Islands and Guiana.
- c.* Africa.
- d.* Indian Ocean.
- e.* Asia.
- f.* Australia and Tasmania.
- g.* New Zealand.

*a.* Canada had the largest, most varied, and most attractive collection of timber and lumber in the Exhibition. The contributions of many private exhibitors were mostly arranged in a great collective exhibit, which contained nearly every form of lumber coming to market,—rough, hewn, sawn, split, and shaved,—some of the pieces of great size. The staple lumbers, especially white-pine, were noticeable for their excellence.

From the forests of British Columbia came two pieces, shown with the Canadian collection, a cross-section and a plank, each more than eight feet in diameter, and both apparently of the Douglas spruce.

From New Brunswick came private exhibits of lumber, and an official description of the useful trees and shrubs of the province.

*b.* From British Guiana were only fibres, but the Atlantic islands, the Bermudas, Bahamas, Jamaica, and Trinidad, had each collections of woods, some of them necessarily containing few species, but those of value.

From Jamaica was a fine collection by Mr. Robert Thompson, superintendent of the Botanic Gardens at Kingston, beautifully shown, containing, besides species of less interest, several valuable tropical commercial woods (mahogany, *lignum-vitæ*, etc.), dye-woods, barks for textiles and tanning, gums, wax, etc., accompanied by a printed catalogue and labels, with common and botanic names and explanatory notes.

Two collections from Trinidad were especially noticeable. One by Mr. H. Prestoe, Government botanist, of sixty indigenous woods, with printed catalogue with English and botanic names, notes of size of trees, specific gravity of the woods, with barks, fibres, etc.; the other by Mr. S. Devenish, Surveyor-General, of the indigenous

woods, and a few others thriving well on the island. The printed list contained two hundred and thirty-six numbers, with English, French, Spanish, and botanic names, and with the Natural Order to which each species belongs.

c. From the African possessions we had a small collection; from the Gold Coast and from the Cape of Good Hope a larger number of specimens, chiefly of the useful woods, and a good collection of tanning materials.

d. From Mauritius, the Seychelles, and the Straits, small collections, interesting because of their locality; and from the latter sandalwood.

e. The collection of woods from India contained about one hundred and seventy-five specimens, all small sections, with the botanic names. As displayed, it was of scientific rather than of economic interest. In the collection of fibres were several from woody plants.

f. Australia and Tasmania were rich in woody species, some of the trees of the genus *Eucalyptus* being the tallest known, over four hundred feet high; others of the same genus have lately acquired a world-wide reputation for medicinal and sanitary virtues.

From Queensland there were several collections, aggregating some six hundred or more specimens. This portion of Australia is peculiarly rich in arboreal species, and it is claimed that these collections, large as they are, contain scarcely a fourth of the indigenous species, and "were chiefly chosen for their economic value." We may here say, that for scientific purposes special observations were made, so far as was possible, on such specimens, in all the collections of woods in the Exhibition, to ascertain, if possible, how far the warping of woods during drying is related to their geographical distribution. As a whole, the woods of warm climates warp much less than those from cold regions, and so far as could be seen, those of Australia and Tasmania are particularly free from this defect, although some of them "check" as badly as the woods of the Northern Hemisphere. Many of the woods are very firm, and possess the other physical properties of valuable timbers.

Apparently the collections of timber and woods from Victoria were originally very fine, but, unfortunately, they were injured in appearance by accident,—immersion in sea-water on the voyage. The Botanic Gardens of Melbourne exhibited a carpological collection of some three hundred species, another of gums and resins, a large collection of barks and fibres, and a collection of forty-five varieties of papers made from the bark, leaves, or stems of nearly as many species of plants, some of them being native woody plants.

The collections from New South Wales were especially noticeable; one from the northern districts, two hundred and twenty-seven species; the other from the southern districts, of one hundred and ninety-five species, accompanied with printed descriptions, the common and botanic names, when known, with notes on the size of the trees, uses, properties, etc. These collections, containing many large planks beautifully polished, were popularly very attractive. The recent attention paid to the planting of the *Eucalyptus* species in various parts of the world gave great interest to the beautiful planks of the woods of this genus, of which there were some fifty numbers, representing nearly as many species.

Tasmania also had a fine display of woods, containing several species of *Eucalyptus*. Mr. C. T. Creswell, of Hobart Town, exhibited seeds of three hundred and sixty-two varieties of forest-trees and flowering shrubs indigenous to Australia and Tasmania.

g. From New Zealand were several collections of woods, the aggregate number of specimens being large. They were exhibited in a variety of forms, and articles made from some of them were presented to show their appearance when finished. There was also a fine exhibit of Kauri gum, a product of the "New Zealand Pine," an article of considerable importance, twenty-six hundred tons of which are said to be exported annually, valued at nearly half a million dollars.

#### CHINA.

China had several small collections, representing six localities, the whole aggregating about one hundred and fifty specimens, with the native names.

#### CHILI.

Chili was represented by several collections, some of ingenious form.

#### EGYPT.

Egypt had a collection of about fifty cross-sections of trees, indigenous and cultivated, mostly with their English, local, and botanic names. African ebony (from her southern possessions), ancient sycamore, and a few kinds known to ancient literature, were the features of most popular interest. With these was a peculiarly interesting collection of crude gums, partly from Nubia and partly from near the Red Sea.

#### JAPAN.

Japan had a museum collection, exhibited by the Imperial Board of Agriculture, of one hundred and three species, ingeniously and



beautifully arranged. Each species was shown in a plank, presenting dressed, unvarnished, varnished, and polished surfaces, with a cross-section showing heart, sap, and bark, and with foliage, flowers, and fruit. Many of the species were also shown in extremely thin longitudinal and transverse sections fastened on paper. There was also a collection of bamboos, and articles made from them.

#### LIBERIA.

From Liberia was a small collection, only noticeable because of its fine cam-wood, which was shown in considerable quantity.

#### MEXICO.

Mexico was represented by nearly thirty collections, of which thirteen were by state governments, societies, and schools, and the remainder by private exhibitors. The collections were in a variety of forms, but it is impossible to say how many species were represented. Some of the collections were accompanied by other forest-products, and in the Mexican catalogue is a description of the more important woods, gums, resins, fibres, etc.

#### NETHERLANDS EAST INDIA COLONIES.

From the Netherlands colonies in the East Indies were interesting collections, containing between three and four hundred species of woods, besides barks, gums, resins, caoutchouc, guttas, etc. The woods embraced dye-woods, ornamental woods, useful species, and others of a merely scientific interest, the whole accompanied by a full-printed catalogue. Some special features of this exhibit will be noticed later.

#### PORTUGAL.

Portugal and her colonies had more than twenty collections of woods, those of the mother-country possessing the most economic and those of the colonies more scientific interest. From Portugal came collections in various forms of all the timber-trees, specimens of the woods of construction, barks, resins, etc., and the tools and implements of forestry. Cork in all its forms and relations was well exhibited, trunks of the cork-oak, specimens of the wood, acorns, large quantities of the bark, both crude and manufactured, and in every stage of growth and manufacture, representing an enormous economic interest. Besides the official, there were about a hundred private exhibits. One manufacturer claims to produce twenty-four millions of corks annually. There was also a very large number of

exhibits of nuts. The colonies of Angola, Azores, Goa, Mozambique, St. Thomas, and Cape Verde had each very large collective exhibits, containing a great variety of products. While all of these were of great interest and some very beautiful, that from Angola was perhaps the most noticeable as well as the most extensive. The beauty and variety of its woods, gums, resins, and lichens should be especially mentioned. Among the woods was a very large specimen of the wonderful *Welwitschia*, nearly three feet in diameter, the rare *Herminiera*, much lighter than cork, along with some of the very firm woods of tropical Africa, some of them much heavier than water. The collection of lichens (archils), medicinal barks and herbs, and textile barks was also large. Among the resins and copals were some half-fossil specimens of special beauty.

#### RUSSIA.

From Russia were sets of specimens of the useful woods and timbers, native and cultivated, tree-seeds in quantity, and various barks, some of them manufactured into boxes, cases, and other useful and ornamental articles.

#### SPAIN.

The Spanish collections, both of the mother-country and of the colonies, were extensive and varied, and more uniform and systematic in the methods of exhibition than those of any other Government. In Spain, as well as in Portugal, the management of forests is a department of the Government, under official Forestral Engineers. The several states, districts, and colonies exhibited collections of woods which, with private exhibits, amounted to over thirty collections. In the official collections there were suites of specimens of a prescribed form, so made that each specimen showed heart, sap-wood, and bark, with the grain on the radial, tangential, oblique, and transverse sections. Thus, each specimen showed what, by some other methods, would require several separate pieces. Accompanying them were exhibits of nearly every class of crude forest-products, and also the tools used in forest-culture. The catalogue number of exhibits, including cork and nuts, amounted to over two hundred, exclusive of most of the colonial collections. The useful woods were of species common to the other countries of Southern Europe. This country, with Portugal, supplies most of the cork used throughout the world; and this product was exhibited in every stage and of every quality, the number of exhibitors being large. There were also many exhibits of nuts. From the principal colonies came rich and interesting collections. From Cuba, a solid mahogany stick twenty-

two and a half feet long and twenty-five inches square. From the Philippine Islands was a very large, varied, and especially interesting series of collections, accompanied with a *Catalogue Memoir of a Collection of Forestal Productions exhibited by the General Inspection of Forests of the Philippine Islands*. The collection was under the supervision of Dr. Sebastian Vidal, the official Forestal Engineer of the islands. The numbers as catalogued extended to over eight hundred, in addition to which there were various articles not enumerated, the catalogue having been printed at Manila and objects added after it was prepared. The collection of woods was the most complete ever made in the Islands, species new even to science being discovered in its collection. There were, according to the catalogue, 1st, two hundred and eighty-one species of woods with list of names and uses; 2d, a collection of woods for fuel, thirty-seven numbers; 3d, charcoals and ashes, twenty numbers; 4th, barks of fifty-nine species, with names and uses, as for tanning, dyeing, cordage, etc.; 5th, resins, gums, and oils, thirty-five catalogue numbers; 6th, fruits and seeds, seventy-five numbers; 7th, specimens of field- and forest-products; 8th, models of vessels and ships, with the woods of which they were made; 9th, miscellaneous forest-products, among which were a plank of tove (*Pterocarpus*) seven and one-fourth feet wide, a rattan one hundred and fifty and one-half meters (four hundred and ninety-three and one-half feet) long, a cable of black-palm fibre (*Caryote urens*) still sound after an immersion of one hundred and twenty years in sea-water, etc.

#### VENEZUELA.

From Venezuela there were a collection of one hundred species of useful woods with their names, the specimens small, however; various forest-vines; a collection of barks, fibres, gums, resins, dye-woods, and medicinal plants; also, miscellaneous forest-products, such as the milk of caoutchouc, the milk of the cow-tree, various seeds, etc.

#### GENERAL SUMMARY.

Space forbids a review in detail of each class of objects that composed the collections enumerated, or anything more than a general glance at a few of them. A detailed review of the various tanning materials (other than chemical extracts) would be interesting. Each country exhibited its own kinds,—oak-barks and sumac-leaves from Europe and the United States, and willow from several European countries, while from others were many species practically unknown among us in the United States. From Brazil, besides barks and

leaves, were large fruits. Both barks and leaves appeared from several countries, some of the exhibits accompanied with chemical analyses showing the percentages of tannin. From Portugal were several exhibits of grape-seeds for this use. We found but few exhibits of useful nuts, as a forest-product, from trees truly wild; but of species usually planted, and often in a state of semi-cultivation, as chestnuts, filberts, and walnuts, there were several hundred exhibits, mostly from Southern Europe.

There were many small, and a few large, collections of seeds of trees and shrubs, the more important of which have been already alluded to. This class afterwards included other classes of seeds, swelling the number of exhibits to some hundreds.

From various countries and states there were exhibited manufactured articles, intended to show the native woods as well as to serve some other obvious use. These were usually articles of furniture or ornament, such as chairs, often of elaborate construction, tables, sometimes inlaid with an immense number of pieces and displaying a great variety of woods, ornamental boxes, etc. The cases in which other exhibits were displayed were also often intended to illustrate the resources of the country in woods for furniture, carving, ornament, or interiors. These articles, however, were usually not exhibited for competition, and where they were they came naturally under the judgment of Judges of other groups. There were also a few exhibits of ornamental woods collected without regard to the country of their production, and generally displayed to call attention to some class of manufactures, or to embellish some other exhibit.

## II.—MANUFACTURED PARTS OF BUILDINGS.

Certain manufactured parts of buildings, carpentry, and mouldings, forming a part of Class 227, with some other articles manufactured of wood, were referred to this group. These exhibits were very varied in character; a portion of them are treated in another general report, and still others would require more space for any satisfactory notice than this sketch will allow. We will only refer incidentally to the Swedish school-house, the fittings up of the Norwegian section in the Main Building, and to certain Scandinavian and other private exhibits noticed in the reports of awards.

## III.—TIMBER AND LUMBER PREPARED TO RESIST DECAY AND COMBUSTION. SECTION 3 OF CLASS 6CO.

There were several exhibits offered in this class, which consisted essentially of a covering of some kind of paint or composition which

more or less excludes the air and moisture, and would thus resist decay and retard ignition, precisely as a coating of well-sanded oil-paint will do, while the wood beneath remains essentially unchanged in character by the process. These, the Judges think, do not come within the intent of the classification by the Commissioners, who illustrate by the words, "as by injection of salts of copper and zinc," etc. Of the many processes devised to accomplish this end, as thus restricted, only two were represented in the Exhibition, so far as has come to our knowledge, and only one of these was for competition. This was by the Burnettizing process, which consists essentially in injection with chloride of zinc. The exhibit by the Eastern Burnettizing Company, Boston, Massachusetts, consisted of shingles and lumber that had been treated, and were alleged to have been used for eleven to nineteen years in positions where they were subject to various influences of decay, which they successfully resisted. Three species of wood were exhibited in specimens, such as shingles, used, according to the testimony of the exhibitors, on roofs eleven years; railroad-ties, eleven to eighteen years; and bridge-timbers, cellar-floor, and sweat-vat, twelve to nineteen years. There were other exhibits of woods treated by this process, not exhibited by the manufacturers, shown for other purposes, and excluded from competition in this group.

There were also several exhibits of woods prepared by the Bethell process, but none were shown by the manufacturers, and none so exhibited as to be eligible for award. The most considerable and interesting was exhibited by Page, Kidder, & Fletcher, of New York, manufacturers of coal-tar products. The process consists essentially in injecting the wood with one of the products of coal-tar distillation, known in England as "creasote oil"; in the United States better known as "dead oil." It is claimed that the process greatly hinders decay, and also preserves the wood from destruction by marine-worms. Many specimens were exhibited, some from English and others from American establishments, consisting of railroad-ties and other timber and lumber said to have been long used, but which were still sound; also, piles and timbers used in salt water, and still sound, contrasted with similar pieces not so treated, more or less destroyed by marine-worms. Along with these specimens were samples of the oil used, a model of the machinery used in the process, etc. We are informed that there are six establishments in the United States using this process. There were other exhibits (one in the United States Government collection) of woods treated by this process.

IV.—FORESTRY; ILLUSTRATIONS OF THE ART OF PLANTING, MANAGING, AND PROTECTING FORESTS; STATISTICS. CLASS 606.

For our present purpose this class can be considered in three sections, viz.:

- a. The planting, care, and administration of forests in general.
- b. The planting and care of trees and shrubs producing commercial products, excluding such cultivated kinds as orchard fruits, almonds, coffee, etc., which are economically imported only as cultivated plants.
- c. The literature of the subject, including maps and statistics.

a. Trees are of such slow growth and long life, and large timber requires so many years to mature, that their cultivation is not attractive to that large mass of the cultivators of the soil who must reap the rewards of their labors year by year, or who, if their necessities are not so pressing, are still impatient for quick profits. Some of the larger timbers on exhibition were of over six hundred years' growth, and a stick of box-wood was shown which was claimed to be over nine hundred years' growth. Hence we see why it is that forestry proper is only practiced on a large scale where there is government aid or supervision, or where a considerable proportion of the land is held in large estates remaining in the possession of the same family from generation to generation. The abundance and variety of native timber originally found and still existing over much of the United States, combined with the character of our landed proprietorship, have tended to make the people careless as to future timber-supplies, and forestry as a science can hardly be said to exist in this country. The nearest approach to it is found in the endeavors to grow trees in portions of the West where the natural supply of wood is scanty.

In a private exhibit from California there was a long section of a trunk of the Australian blue-gum (*Eucalyptus globulus*) "eleven years old" and "sixty feet high." The section was eighteen inches in diameter, exclusive of bark, at the base, and thirteen inches at five feet above. This species is now extensively planted in the State.

From Iowa were specimens in boards of the wood of cultivated native and exotic forest-trees, some of them showing very rapid growth, as "silver-leaf maple, nine years old," seven inches in diameter exclusive of the bark; "ash-leaved maple, eight years old," eight inches in diameter; "chestnut, fifteen years old," nine inches; "persimmon, twenty-seven years old," nineteen inches, etc.; a considerable number of species having been thus shown.

In the Kansas collection there was also a collection of the woods, in cross-sections, of cultivated forest-trees of native and foreign species. Cottonwood, "seventeen years from the seed," with a diameter of twenty inches (these diameters are of the wood exclusive of bark, and as now shrunk by drying); Scotch fir "eleven years old," and nine inches in diameter; "maple, ten years from the seed," eleven inches; "soft-maple, eight years from the seed," six and one-half inches; "white-oak, ten years old," six inches; and so on through a considerable number of species. A few specimens from planted trees occurred in other State collections without special information of importance regarding them.

From other countries, however, the exhibits were far different. In Spain, the forests are largely under state management and control, each district having its "Forestral Engineers," who are public officers, and its "Inspection of Forests," which is a department of the Government. The official collective exhibits of this country were mainly through this department, and in the collections no distinction was made between such timbers as are self-planted and those planted by art. A similar state of facts existed in regard to the collections of Portugal and various other countries. Not unfrequently more or less complete displays of the implements and tools used in forestry were shown, as in the Portuguese and Spanish collections, and from several countries came tree-seeds in quantity of a few of the more important species.

b. Closely related to the planting of forests is the growing of semi-cultivated trees and shrubs yielding commercial products other than wood and timber, such as cork, caoutchouc, chestnuts, walnuts, filberts, carob-beans, resins, cinchona, tan barks, etc. The only exhibit of this kind from the United States which came before this group for competition was that of pecan-nuts, from Louisiana. The exhibit was from a grafted tree, or an artificially-planted stock, the exhibited product being of such great excellence as to promise profit to those who would intelligently extend its cultivation. From Southern Europe, particularly from Portugal, Spain, and Italy, the number of exhibits of nuts was very large, amounting to some hundreds. What can be done by the selection of seed for planting, choice of soil, and other treatment known to art and science, was well seen in the number of varieties of the European walnut on exhibition, where the variety is so great that, were only the extremes known, the botanist might consider them distinct species. In those countries chestnuts constitute a still more important crop, in some districts almost taking the place of bread, in others constituting an important item of food for

some millions of people, and the exhibits were varied and numerous. Even acorns and pine-nuts, as articles of human food, as well as for animals, were exhibited from several countries.

Of cork we have already spoken, as being largely the product of Spain and Portugal. These countries appear to be the great producers of this necessary article, partly because of favorable climate and soil, but more because of the existence of the systems of public forest-culture and administration. Small specimens were shown from several other countries.

Several species of *cinchona* furnish the "Fever-bark," which is the raw material from which quinine and a few other similar medicinal alkaloids are extracted. Thirty-six species are known to science, all natives of the tropical Andes. All contain quinine, but only a small part of them are of much importance in commerce. As its use spread throughout the civilized world, and the methods for chemically extracting the drug were improved, the demand rapidly increased, and the natural supply of bark as rapidly decreased. When a demand arises for any forest-product, the native forests are soon despoiled of the trees which produce it, for no trees growing wild, and especially if they are the property of no one in particular, can withstand the reckless and improvident attacks made by those who procure the crude materials for commerce. The more valuable the product or more urgent the demand, the more sure the destruction. This has been the history of various products, and is emphatically that of the quinine-producing trees, where the raw product is the bark, a vital part of the tree. As the demand for the drug becomes more imperious and the natural supply more uncertain, the necessity for its cultivation becomes more obvious. The Netherlands claim to have been the first to produce the bark as a commercial product from trees artificially planted, in their East India colonies, and their exhibit was by far the finest of its kind in the Exhibition. According to the Netherlands Sectional Catalogue, the first cinchona-trees were introduced into Java from European Botanic Gardens in 1851. In 1852 a botanist was sent by the Dutch Government to Peru, where he investigated the different species in their native localities, and collected plants and seeds of the more valuable species. Some of these were sent to Holland *viâ* Panama, and thence to the Dutch East Indies, but more were carried in 1854, by a Dutch man-of-war sailing directly from Callao to Java. From that time to this the cultivation has gone on, and in March, 1875, the several Government plantations contained more than two millions of trees, the whole under charge of the chemist and botanist, J. C. Bernelot Moens, who



made the exhibit here. This exhibit consisted of herbarium specimens of the foliage, flowers, and fruit of seven species in ten varieties, with sections of their wood, bales of bark, photographs of the plantations, pulverized bark, large jars of quinine and the other alkaloids, the whole accompanied with a printed account of the history, treatment, and cultivation of the species, chemical analyses of the several kinds of bark, both as they occur wild and from the cultivated trees, with the relative amount of the several alkaloids in each, also a description of the laboratory for extracting the alkaloids for commerce, etc. We have no statistics of the commercial production.

In British India the cultivation of cinchona began, we think, about the same time, or soon after. In the Indian collection (see special Catalogue for India, Nos. 546-549) there were four small exhibits of bark, of two species, from the Neilgherry Hills, the principal seat of the industry. In the private exhibit of a chemical manufacturer was a larger quantity of bark from the same source, shown as a curiosity. A recent scientific journal states that the harvest of bark from the whole Madras Presidency for the year 1875 was 130,000 pounds. A part of this was from private plantations supplied with trees from Government nurseries.

From Jamaica the bark of three species, and the peeled trunk of a tree, were exhibited by Mr. Robert Thompson, Government botanist for that island. The cultivation was begun there by the Government in 1868, and three hundred acres are now planted. (See descriptive Catalogue of Jamaica, Nos. 229-231.)

From Cordova, Mexico, three species were exhibited by Mr. Hugo Frink. Each was shown in specimens of the bark, foliage, flowers, fruit, and sections of the trees. This exhibit was especially interesting, because it was the only one in the Exhibition which came to our notice where the cultivated product was entirely due to private enterprise. We have no information as to its commercial success.

The only exhibit of cinchona as a wild forest-product was from Venezuela. Three species were shown, with the statement (Venezuelan special Catalogue, Nos. 161-163) that the annual export amounts to about sixty thousand pounds of the bark, most of which comes to the United States.

There were several exhibits of living rubber-producing plants, embracing a considerable number of species; but they were shown along with exhibits of rubber or other products, or as botanical specimens, and not as cultivated trees producing a commercial product. In fact, as yet, rubber, as a commercial product, is nowhere produced from cultivated trees.

c. From the United States the only forest literature exhibited and coming under our notice were several annotated Catalogues of exhibits, and they related to natural products rather than to cultivated woods. The most important was the Catalogue of the Government collection of woods, by Dr. Vasey; that of Michigan, by Professor Beal; and of West Virginia, by Mr. Maury, each of which has already been noticed when speaking of the wood-exhibits they describe. Similar to the above, but fuller in description and not accompanied by specimens of the woods themselves, was a descriptive Catalogue of the *Trees and Shrubs of New Brunswick*, by Professor L. W. Bailey. From the United States were two woodland maps. The first, especially prepared for the Exhibition, was a large "map showing in five degrees of density the proportion of woodlands to farm-areas of the United States. Compiled from returns of the Ninth Census, by J. R. Dodge, Statistician, Department of Agriculture." This map did not profess to show the actual distribution or density of our forests, but the proportion of woodland to non-woodlands in the cultivated farms was well indicated. The second was a small printed map, forming one of the set published by Congress in Professor Walker's Statistical Atlas of the United States, prepared by Professor William H. Brewer, showing the actual distribution of woodlands in six degrees of density. It was founded partly on the returns of the Ninth Census, and partly on estimates made by many observers, official and unofficial, independently of each other. The map was accompanied by a short memoir. In the same statistical atlas, which was exhibited both as a Government and a private exhibit, and in the published report of the Ninth Census, were the statistics of lumber production and lumber manufacture in the country; but the map, memoir, and statistical tables formed only a part of much more extensive figures, and were not a separate work devoted to forest-productions.

From Mexico there was a botanical map of a part of the State of Queretaro, by Sr. Mariano Barcena, which is, so far as we have knowledge, the first botanical map of any part of Mexico. The distribution of various orders of vegetation was shown in eleven colors, the map being only forestal in so far as the special orders shown are particularly woody orders.

Several of the countries of Europe exhibited topographical maps prepared from official surveys. Some of these maps showed a wonderful amount of detail, and, as one of the features, woodlands and forests were shown wherever they occur. Such maps are forestal and statistical only in this, that they show the forest-area as one of

the features to be portrayed on a general and topographical map, and in this sketch may be passed by. They are only noticed because it may possibly explain why some countries which were otherwise so well represented in the Exhibition by maps, had none especially devoted to forest-features or forest-products. Of the countries represented by maps and literature specially pertaining to this subject, we have the following :

From Russia was a series of ten published official maps of European Russia, showing by shadings and lines the distribution and relative densities of forests, the range and limits of six of the more important timber species, the areas of the entire forests in comparison with those of the state forests and of each with the areas of territory, the relation of forest-areas to total populations and local populations, the management and working of forests, and the mean annual revenues of the Government forests in each state. These were accompanied by statistics, and by a memoir on the forests and their products. These ten forest maps were a part of a larger series, in which were ten other maps relating to meteorology, temperature, agricultural productions and statistics.

From Norway there were a forest map showing the economic relations in 1870, and a botanical map giving the limits of range of growth of every timber species (along with others), whether wild or cultivated.

From Spain, where the forests are under Government supervision, we had a volume of titles, with notes on contents of all the literature relating to forests which has appeared in Spanish, whether original or in translations, by Don José Jordana y Morera, Forestal Engineer. The literature is grouped into classes, and extends to eleven hundred and twenty-six titles.

From Portugal we had three maps and a chart showing the distribution of forests, the distribution and limits of the more important species, with their relation to the topography of the country, the climate, and their proximity to the sea, and the relative economic importance of forest-products in the different districts.

From the Philippine Islands we had the Catalogue memoir already spoken of, which contained information relating to the use of the various woods, statistics of production and export, and two colored maps showing the distribution of the forests on the islands of the Archipelago.

# REPORTS ON AWARDS.

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## GROUP VI.

### 1. Parmentier-Gosset & Co., Sivry (Hainaut), Belgium.

#### MANTELS IN BLACK AND WHITE MARBLES.

*Report.*—Commended for originality and good taste of designs, good quality of material, and excellence of workmanship.

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### 2. F. Tainsy, Brussels, Belgium.

#### MARBLE MANTELS.

*Report.*—Commended for the beauty of the designs, the good quality of the material, and the excellence of the workmanship.

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### 3. Myers, Uhl, & Co., Cleveland, Ohio, U. S.

#### MARBLE MANTEL (OHIO STATE BUILDING).

*Report.*—Commended for good quality of material and good workmanship.

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### 4. Wilson Gilmour & Co., St. John, New Brunswick, Canada.

#### MARBLEIZED SLATE MANTELS.

*Report.*—Commended for good taste of design and good workmanship.

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### 5. G. & J. Cool, Amsterdam, Netherlands.

#### MARBLE MANTELS.

*Report.*—Commended for the good quality of the marble and finished workmanship of the mantels.

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### 6. The Williams Marble and Slate Manufacturing Co., Philadelphia, Pa., U. S.

#### MARBLEIZED SLATE MANTELS.

*Report.*—Commended for originality and good taste of design, excellence of workmanship, and magnitude and variety of exhibit.

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### 7. A. L. Fauchere & Co., New York, N. Y., U. S.

#### MARBLE MANTELS.

*Report.*—Commended for originality and good taste of design, beauty of material, and excellence of workmanship.

## 8. Fisher &amp; Bird, New York, N. Y., U. S.

## MARBLE MANTELS.

*Report.*—Commended for originality and beauty of design, good quality of material, and good workmanship.

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## 9. C. B. Evans Mantel and Grate Co., Cincinnati, Ohio, U. S.

## CAST-IRON MARBLEIZED MANTELS.

*Report.*—Commended for good taste of design and excellence of workmanship.

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## 10. Wilson &amp; Miller, Philadelphia, Pa., U. S.

## MARBLEIZED SLATE MANTELS AND OTHER SLATE WORK.

*Report.*—Commended for variety of exhibit and good workmanship.

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## 11. Michael Sarver, Santa Barbara, Cal., U. S.

## MAMMOTH GRAPE-VINE OF SANTA BARBARA.

*Report.*—This vine was probably the largest and the most productive cultivated vine in the world, the stock having a diameter of eighteen inches. There is abundant evidence that its annual yield was above six thousand pounds. It is of the "Mission" variety.

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## 12. State of Kansas, Topeka, Kansas, U. S.

## FOREST AND CULTIVATED WOODS OF KANSAS.

*Report.*—Commended for the size and character of the exhibit, which contains both the native woods and sections of cultivated trees, showing rate of growth; the whole accompanied with full list of the same, with common and botanical names.

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## 13. State Commissioners of Maryland, Annapolis, Md., U. S.

## WOODS.

*Report.*—A good exhibit of woods arranged in triplicate, showing bark, smooth surface, and transverse and vertical sections; botanical names on all.

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## 14. State Commissioners of Oregon, Portland, Oregon, U. S.

## FOREST WOODS OF OREGON.

*Report.*—Commended for the interest and variety of the exhibit, some of the specimens of timber trees being of most gigantic size.

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## 15. State Government of Mexico, Toluca City, Mexico.

## NATIVE WOODS OF THE STATE.

*Report.*—Commended for the interest of the collection, which contains twenty-five species.

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## 16. State Government of Campeche, Mexico.

## NATIVE WOODS AND FOREST PRODUCTS.

*Report.*—Commended for the extent and interest of the collection, which contains twenty-four species of woods, including ebony and dye-woods, each species usually represented by many specimens; also caoutchouc.

**17. Committee of the Azores, Portuguese Government.****WOODS.**

*Report.*—A good exhibit of woods representing great commercial interests.

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**18. Government Exhibit, Argentine Republic, Buenos Ayres.****COLLECTIVE EXHIBIT OF WOODS AND BARKS.**

*Report.*—Commended for the extent and variety of the exhibits, the beauty of the specimens, many of which are very valuable, and the manner in which the samples are prepared.

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**19. State Government of Morelos, Cuernavaca City, Mexico.****COLLECTION OF WOODS OF THE STATE.**

*Report.*—An interesting collection of many specimens, embracing, however, but fourteen species, shown in a variety of ways.

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**20. State Government of Puebla, Puebla, Mexico.****NATIVE WOODS OF THE STATE OF PUEBLA.**

*Report.*—Commended for the interest of the collection, which contains thirty-two species.

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**21. State Government of Hidalgo, Pachuca City, Mexico.****NATIVE WOODS AND VEGETABLE PRODUCTS.**

*Report.*—Commended for the interest and extent of the exhibit, which contains forty-six species of woods, dye-woods, and vegetable wax.

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**22. Pskof Statistical Committee, Pskof, Russia.****LINSEED.**

*Report.*—Commended for the fine quality, as shown in the exhibit.

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**23. Odessa Exchange Committee, Odessa, Russia.****COLLECTIVE EXHIBIT OF VARIOUS SEEDS.**

*Report.*—Commended for the excellence of the exhibit, which contains linseed and rape seeds; peas and beans.

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**24. Department of Lands and Agriculture, Melbourne, Victoria, Australia.****WOODS.**

*Report.*—A large and excellent exhibit of woods, well arranged, and having botanical name and description on each specimen.

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**25. Agricultural Society of Oporto, Oporto, Portugal.****WOODS.**

*Report.*—Commended for the size and variety of the exhibit, which contains one hundred and fifty specimens dressed, and also showing plain and varnished finish.

**26. Imperial Board of Agriculture, Industry, and Commerce, Tokio, Japan.**

COLLECTION OF WOODS.

*Report.*—This collection includes one hundred and sixty-three species of woods of Japan, shown in transverse, oblique, and longitudinal section (natural surface and varnished) of blocks mounted on boards, and accompanied in most cases with foliage, flower, and fruit. It is a remarkably complete and satisfactory exhibit.

**27. National Society of Agriculture, Santiago, Chili.**

BUILDING AND ORNAMENTAL WOOD SPECIMENS.

*Report.*—A satisfactory exhibit of fifty-three Chilean building and ornamental woods, in specimens showing both plain and varnished finish, and labeled with the botanical and Spanish (Chilian) names; also a collection of tree seeds and commercial herbs.

**28. Ottoman Government, Turkey.**

COLLECTIVE EXHIBIT OF FRUITS, PLANTS, AND SEEDS.

*Report.*—A collective exhibit containing woods, seeds, fruits, various dye-materials, barks, gums, resins, and black amber.

**29. Colonial Department of Netherland Indian Government, The Hague, Netherlands.**

WOODS, GUMS, RESINS, AND OTHER FOREST PRODUCTS.

*Report.*—It is a large collection (some five or six hundred specimens) of woods, with a valuable exhibit of gums, vegetable waxes, caoutchoucs, and guttas. Recommended for its size, variety, and commercial interest.

**30. National Museum of Egypt, Cairo, Egypt.**

WOODS AND GUMS.

*Report.*—Commended for the geographical and scientific interest of the exhibit, which consists of about forty varieties of woods (in sections) grown in Egypt, and twelve varieties of crude gums, mostly from the shores of the Red Sea and Soudan.

**31. General Inspection of Forests of Cuba, Havana, Cuba.**

COLLECTION OF WOODS AND TIMBERS OF CUBA.

*Report.*—Commended for the excellence of the exhibit, which contains one hundred and sixty-four specimens of woods, in the form prescribed by the engineers; that is, uniform with all the Spanish official collections, and with the common and botanical names.

**32. J. C. Bernelot Moens, Government Botanist of the Netherlands Colonies in Java.**

COLLECTION TO ILLUSTRATE CINCHONA CULTURE.

*Report.*—Commended for the comprehensiveness of the exhibit, which includes eight species and ten varieties, shown with wood, bark, foliage, fruit, and flowers; the bark as a commercial product of the best varieties; the quinine and other alkaloids manufactured from the same; photographs of the plantations, with printed report of the history of the culture, cost of production, and the relative richness of the various varieties in alkaloids as compared with the wild plants.

**33. General Inspection of Forestry of the Philippine Islands.**

## COLLECTIVE EXHIBIT OF FOREST PRODUCTS OF THE PHILIPPINE ISLANDS.

*Report.*—Commended for the excellence and fullness of the exhibit, which consists of two hundred and eighty-one woods, some of them new to science, and is the fullest collection of Philippine woods yet made; a collection of fire-woods, charcoals, and ashes; barks for tanning, cordage, textiles, and dyeing; gums and resins; models of ships, with each kind of timber in its appropriate place.

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**34. Inspection of Forests of Porto Rico, Porto Rico.**

## WOODS OF PORTO RICO.

*Report.*—Commended for the excellence of the exhibit, which consists of one hundred and ninety-six species of the prescribed form, with the common and scientific names.

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**35. Huelva Institute of Second Teaching, Huelva, Spain.**

## WOODS OF THE DEPARTMENT OF HUELVA.

*Report.*—A fine collection of one hundred and four species of the prescribed form, with common and botanic names, with description of localities, time of cutting, and remarks on value and uses.

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**36. National School of Forestry (Department of Engineers), Madrid, Spain.**

## WOODS AND FOREST PRODUCTS OF SPAIN.

*Report.*—Commended for the general excellence and fullness of the exhibit, which includes a large collection of woods of prescribed form and pattern, with common and botanic names; a forest herbarium; sundry forest products other than woods; a large collection of corkwoods (slabs of cork); implements and tools used in forestry; books, publications, and maps relating to the forests of Spain.

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**37. Government of Brazil, Rio de Janeiro, Brazil.**

## WOODS.

*Report.*—A special collection of ship-building woods, containing thirty-two specimens. This exhibit shows a fine variety of specimens, all of which are useful and valuable, especially adapted for the purposes intended, and shown as being actually in use.

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**38. Provincial Committee, Maranhão, Brazil.**

## WOODS.

*Report.*—A fine collection of woods cut in book form, with botanic name on every specimen, making a very beautiful and interesting exhibit.

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**39. Provincial Committee, San Paulo, Brazil.**

## WOODS.

*Report.*—A large collection of woods, containing three or four samples of each species, with many fine specimens of timbers used in ship-building and construction of railways and bridges, together with some beautiful woods for furniture.



## 40. Government Statistical Bureau, Christiania, Norway.

## FOREST MAP.

*Report.*—This is a fine woodland map of Norway, bearing on its face evidence of great care and research, showing by shadings the distribution of forests throughout the country, from the region where both fuel and building wood have to be imported, to those sections where both are articles of export.

## 41. State of New Jersey, U. S.

## COLLECTION OF THE WOODS AND TIMBERS OF NEW JERSEY.

*Report.*—Commended for the size, completeness, and manner of exhibition. The exhibit contains about one hundred and fifteen or one hundred and twenty species, in triplicate specimens, showing radial, transverse, and diagonal finish.

## 42. State of Delaware, U. S.

## WOODS AND TIMBER.

*Report.*—Commended for the general excellence of the exhibit, which consists of—1st, sections of trees, some of very great size; 2d, ship-knees; 3d, specimen blocks of native woods.

## 43. Director of the Botanic Gardens at Melbourne, Victoria, Australia.

## CARPOLOGICAL COLLECTION, WOODS, TIMBERS, GUMS, AND RESINS.

*Report.*—Commended for the fullness of the exhibit, the large number and variety of the specimens, and the scientific and commercial interest of the collection.

## 44. Michigan State Agricultural College, Lansing, Mich., U. S.

## WOODS AND LUMBER.

*Report.*—This is a fine collection of woods and lumber, and is of value both scientifically and commercially. Nearly every species of wood is shown by two or three specimens, thus enabling the observer to form an accurate idea of the timber of the State in its various forms. This collection also contains some remarkable botanical curiosities.

## 45. State Centennial Board of West Virginia, U. S.

## WOODS AND TIMBERS OF WEST VIRGINIA.

*Report.*—Commended for completeness and special excellence. The exhibit consists as follows: 1st, about eighty species exhibited as cabinet specimens, beautifully prepared, well named and classified; 2d, sixty-three specimens, dressed and varnished to show commercial uses and manufactured appearance; 3d, a large number of rough sections of timber-trees, some of great size and excellence of quality; 4th, veneers, both in the rough and polished.

## 46. New South Wales Commissioners.

## WOODS AND TIMBERS OF NEW SOUTH WALES, WITH BARKS.

*Report.*—Commended for the comprehensiveness of the exhibit, as well as size, beauty, and manner of exhibiting the specimens. This exhibit consists of one hundred and ninety-five species, accompanied with the scientific and common names, their natural orders, with remarks on the size, uses, character, and localities of the trees. Many of the specimens are of large size. Also, seeds, ginger-root, and barks.

47. **Robert Thomson, Superintendent of the Government Botanic Gardens, Kingston, Jamaica.**

WOODS AND OTHER PRODUCTS.

*Report.*—An exceedingly valuable and interesting collective exhibit, containing fifty specimens of woods, most of them very valuable, and all well arranged and described; three varieties of cinchona bark, several valuable dye-woods, and a large and varied exhibit of medicinal and edible herbs and nuts.

48. **Davis, Wire, & Co., Philadelphia, Pa., U. S.**

NORTH CAROLINA SHINGLES.

*Report.*—The roof form in which the cedar shingles are presented gives a clear conception of the merits of the ribbed form of manufacture. The chief advantage of this class of shingles consists in their capacity to admit air under the shingles, and relieves the roof from any accumulation of water or dampness, prolongs the period of decay and the continuation of the roof.

49. **Iowa State Horticultural Society, Des Moines, Iowa, U. S.**

COLLECTION OF WOODS, BY PROF. H. H. M'AFFEE.

*Report.*—A good State exhibit, containing one hundred and sixty specimens, arranged in vertical and transverse sections.

50. **J. G. Hurkamp, Fredericksburg, Va., U. S.**

VIRGINIA SUMAC.

*Report.*—It is a good exhibit of American sumac, ground and unground.

51. **Walter Hill, Director of Botanic Gardens, Brisbane, Queensland, Australia.**

WOODS AND TIMBER.

*Report.*—The exhibitor shows two fine collections, one a botanical collection of woods, with the name and uses on each specimen, and the other a large commercial exhibit of Queensland timbers.

52. **H. Prestoe, Government Botanist, Trinidad.**

WOODS.

*Report.*—A good collection of woods, well selected and botanically described.

53. **Francisco Valencia, Colima City, Mexico.**

NATIVE WOODS FROM THE STATE OF COLIMA.

*Report.*—Commended for the completeness of the collection, which contains about forty species carefully arranged and classified.

54. **Luis Resoagli, Corrientes, Argentine Republic.**

WOODS.

*Report.*—Commended for the variety and excellence of the exhibit, and for the fine quality of the woods, some specimens of which are made into hubs for wheels, and are exceedingly heavy and strong.

55. **Dr. Berja Castro, Bahia, Brazil.**

WOODS.

*Report.*—Commended for the variety and excellent quality of the collection.

## 56. Dr. Rufino de Almeida, Pernambuco, Brazil.

DYE-WOODS.

*Report.*—Commended for large variety and excellent quality.

## 57. Victor Videla, Province of San Luis, Argentine Republic.

WOODS.

*Report.*—A well-arranged and interesting exhibit of woods, containing some beautiful specimens.

## 58. Cecilio Echevarria, Rosario de Santa Fé, Argentine Republic.

WOODS.

*Report.*—Commended for the beauty and variety of the samples shown.

## 59. Jacinto Jimenez, Cuernavaca City, State of Morelos, Mexico.

A LOCAL COLLECTION OF NATIVE WOODS.

*Report.*—Commended for size and interest of the collection, which consists of sixteen species, exhibited in a large number of specimens.

## 60. Jose Joaquim de Araujo Silva, Campos, Brazil.

WOODS.

*Report.*—A fine cabinet collection of woods, varnished on one side, neatly arranged, and scientifically named.

## 61. Baron de Villa Franca, Rio de Janeiro, Brazil.

WOODS.

*Report.*—A fine exhibit of woods, with large samples, part polished and varnished, and part simply dressed, giving an excellent idea of the wood in its various conditions. All these samples have botanical names.

## 62. Western North Carolina Land Co., Charlotte, N. C., U. S.

COMMERCIAL WOODS.

*Report.*—About seventy specimens of woods of economic importance to the region, with pine shingles, the woods finely shown to exhibit their qualities.

## 63. Oregon Furniture Manufacturing Co., Portland, Oregon, U. S.

BURLS AND MAPLE.

*Report.*—Commended for beauty of specimens.

## 64. Woods, Perry, &amp; Co., Cleveland, Ohio, U. S.

WHITE PINE LUMBER.

*Report.*—This exhibit is a fine commercial display of white pine lumber. It contains a full line of samples of the different qualities of white pine, with labels on each, and also the largest and best plank of clear pine on exhibition.

## 65. Illinois Industrial University, Champaign, Ill., U. S.

## WOODS OF ILLINOIS.

*Report.*—Commended for excellence of the collection, which consists of about two hundred samples, named and accompanied with notes of growth and range.

## 66. J. Vasconcellos Carneiro Menezes, Oporto, Portugal.

## A COLLECTION OF SEVENTY-FIVE SPECIMENS OF PORTUGUESE WOODS.

*Report.*—Commended for the excellence of the exhibit and manner of exhibition.

## 67. Map Department of the Board of Public Works, prepared by Barros Gomes and Welwitch Bros., Lisbon, Portugal.

## MAPS AND CHART OF PORTUGUESE FORESTS.

*Report.*—Three maps and one chart show—1st, the distribution of the forests; 2d, the relative distribution and range of the more important species; 3d, their relations to the topography and geology of the country; 4th, their relation to the sea and climate; and 5th, their relative economic importance in different districts.

## 68. Victor Lopez Seoane, Ferrol, Spain.

## SPANISH WOODS.

*Report.*—Commended for the completeness of the collection for a private one. It contains ninety-one specimens.

## 69. Casto de Olano, Manila, Philippine Islands.

## A VERY LARGE "NARRA" PLANK.

*Report.*—Commended for the size of the timber, the planks being upwards of seven feet wide; the timber known as "Narra" (*Pterocarpus Santalinus*).

## 70. Peter Verekha, St. Petersburg, Russia.

## WOOD SECTIONS, SEEDS OF TREES, FOREST MAP, AND REPORT.

*Report.*—Sections of about twenty-seven species of forest trees, with statistical reports, with map of forest productions in Russia.

## 71. P. A. O'Shanesy, Rockhampton, Queensland, Australia.

## SECTIONS OF FOREST TREES.

*Report.*—This collection, though not large, is meritorious as being a fine local exhibit, and contains some beautiful and valuable specimens.

## 72. Dr. A. Ermelindo de Leao, Paraná, Brazil.

## WOODS.

*Report.*—This is an excellent collection of Brazilian woods, well arranged and botanically named, and containing many fine specimens.

## 73. J. M. C. Cavalcante, Alagoas, Brazil.

## WOODS.

*Report.*—A fine collection of building and ornamental woods, containing a large variety and many beautiful and valuable specimens; all botanically named.

## 74. Francisco Domingo, Barcelona, Spain.

## THE WOODS OF HIS ESTATE.

*Report.*—Commended for beauty of illustration as well as completeness. One series in book form, inclosing the foliage and fruit; another, in which glass cases are inclosed within the divided trunks.

## 75. Rafael Roldan y Cruz, Gibara, Cuba.

## MAHOGANY LOG.

*Report.*—Commended for excellence of the wood and great size of the log, which is twenty-two and a half feet long and more than two feet square.

## 76. Mariano Sanz, Valladolid, Spain.

## “PINE KERNELS” (PINE SEEDS PREPARED FOR FOOD).

*Report.*—Commended for excellence of the exhibit, as shown by appearance, preparation, and flavor.

## 77. Government of Venezuela.

## COLLECTIVE EXHIBIT OF FOREST PRODUCTS.

*Report.*—This is an interesting exhibit, consisting of one hundred specimens of native woods for cabinet and building uses, tan barks, cinchona barks, gutta-percha, cow-tree milk, gume and resins, dye-wood, and archil, besides various medicinal materials.

## 78. Hermann Pfeiffer, Reus, Tarragona, Spain.

## EIGHTEEN VARIETIES OF FILBERTS.

*Report.*—Commended for number of varieties and superiority of the better kinds.

## 79. Francisco Sortres, Reus, Tarragona, Spain.

## FILBERTS (MORELLA VARIETY).

*Report.*—Commended for superior excellence.

## 80. Provisional Board of Agriculture, Castellon, Spain.

## WALNUTS.

*Report.*—Commended for excellence of quality. The Board also exhibited chestnuts very fine in appearance, but now injured.

## 81. R. H. Williams, Milford, Delaware, U. S.

## QUERCITRON BARK.

*Report.*—It seems to be well prepared and of good appearance.

## 82. Sebastian Garcia, Scala Dei, Tarragona, Spain.

## FILBERTS.

*Report.*—Commended for size and excellence.

## 83. Manuel Candado, Coles, Orense, Spain.

## FILBERTS.

*Report.*—A distinct variety, of great excellence.

## 84. D. Agustin Peyra, Barcelona, Spain.

## WALNUTS AND FILBERTS.

*Report.*—Commended for appearance and quality of both walnuts and filberts. Of the filberts there are several varieties; some are specially fine.

## 85. Señores Consul y Virgili, Tarragona, Spain.

## FILBERTS.

*Report.*—Two varieties, one of specially large size, and both of great excellence.

## 86. Manuel Pereiro Rey, Orense, Spain.

## FILBERTS AND DRIED CHESTNUTS.

*Report.*—Commended for size and excellence of both, as well as good preparation of the latter.

## 87. Ramon Anguera, Falset, Tarragona, Spain.

## FILBERTS (MORELLA VARIETY).

*Report.*—Commended for superior excellence.

## 88. D. Ramon Agelet, Lerida, Spain.

## WALNUTS.

*Report.*—Commended for good qualities.

## 89. Agricultural Society of Valencia, Spain.

## WALNUTS.

*Report.*—Commended for excellence of flavor.

## 90. Tomas Vicente Fernandez, Fuentesauco, Spain.

## WALNUTS.

*Report.*—Commended for excellence of flavor and appearance.

## 91. D. Clemencia Pinto, Villa Boim, Elvas, Portugal.

## ACORNS (FOR MAN AND BEAST).

*Report.*—Commended for superior size and importance of the product.

## 92. José Coll, Valls, Tarragona, Spain.

## WALNUTS.

*Report.*—Commended for good appearance and qualities.

## 93. Tomas Fernandez, Armunia, Spain.

## WALNUTS.

*Report.*—Commended for appearance and quality.

## 94. F. N. Bailey, Queensland, Australia.

## BOTANICAL COLLECTION; PLANTS OF QUEENSLAND.

*Report.*—Commended for the magnitude of the collection, and the neatness and accuracy with which they have been classified and mounted.

95. **E. S. Morris & Co., Philadelphia, Pa., U. S.**

CAMWOOD (FOR DYES) FROM LIBERIA.

*Report.*—Commended for quantity and excellence of this exhibit, which is part of the Liberia collection.

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96. **Luiz Bernardo S. Maris Castro, Amedo, Anisáco, Braganza, Portugal.**

WALNUTS.

*Report.*—Commended for the very fine quality and moderate prices.

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97. **C. F. Creswell, Hobart Town, Tasmania.**

COLLECTIVE EXHIBIT OF FIELD SEEDS, AND SEEDS OF TREES AND SHRUBS.

*Report.*—A fine collective exhibit, containing tares, several varieties of peas, beans, various clovers, lucerne, rye-grass, linseed, and rape; also a large and interesting exhibit of great variety of seeds of forest trees and flowering shrubs native to Tasmania and the Australian Colonies.

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98. **Verissimo Forreiro Annes d'Oliveira, Montalvo, Santarem, Portugal.**

WALNUTS.

*Report.*—Commended for the excellent quality of the exhibit.

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99. **Dr. Jara, Loulé, Faro, Portugal.**

CAROB BEANS (ALGAROBÁ).

*Report.*—Commended for excellence in quality (two grades) and magnitude of the production.

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100. **Pe. Antonio Luiz Gomes, Valença, Vianna do Castello, Portugal.**

THIN-SHELLED WALNUTS.

*Report.*—Commended for special qualities of the nuts, thin shells, and fine flavor.

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101. **Cross & Mehling, Grand Rapids, Mich., U. S.**

ARTIFICIAL VENEERS.

*Report.*—Commended for excellence of workmanship and exact imitations of beautiful and valuable woods.

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102. **Luiz Antonio de Magalhaes, Fundão, Castello Branco, Portugal.**

DRIED CHESTNUTS.

*Report.*—Commended for excellence of the exhibit and quantity of production.

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103. **Angelica Rosa de Jesus Maria, Mercado do Anjo, Oporto, Portugal.**

COLLECTIVE EXHIBIT OF WALNUTS AND DRIED CHESTNUTS.

*Report.*—Commended for excellence of the exhibit, the dried chestnuts being particularly fine.

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104. **Macatee & Bro., Front Royal, Va., U. S.**

GROUND SUMAC (FOR TANNING).

*Report.*—Commended for excellence and quantity of the exhibit.

**105. Castorina & Parlato, Catania (Sicily), Italy.**

SUMAC (FOR TANNING)—EXHIBIT OF LEAVES WHOLE AND PREPARED.

*Report.*—Commended for quality of the material and extent of the production.**106. Cav. Luigi Mazzullo, Messina, Italy.**

WALNUTS.

*Report.*—Commended for very large size and good quality.**107. Nicola Niceforo, Catania, Italy.**

FILBERTS.

*Report.*—Commended for very superior size and quality.**108. Mariano Barcena, City of Mexico, Mexico.**

BOTANICAL MAP OF A PART OF THE STATE OF QUERETARO.

*Report.*—Commended for novelty and excellence. In eleven colors it shows the distribution of kinds or orders of vegetation.**109. Charles Hendry, Conestoga, Ontario, Canada.**

LINSEED.

*Report.*—Commended for excellence and purity of the exhibit.**110. National Preparatory School of the City of Mexico, Mexico.**

HERBARIUM.

*Report.*—An herbarium of Mexican plants, classified, named, and arranged in six large volumes. Recommended for interest and excellence.**III. Portuguese Government.**

COLLECTIVE COLONIAL EXHIBIT OF FOREST PRODUCTS.

*Report.*—Commended for the very large and interesting exhibit of woods, resins, gums, copals, barks, lichens, and medicinal barks and herbs from its colonies.**112. Department of State of Beja, Portugal.**

CORKWOOD.

*Report.*—Commended for the excellence and variety of the collective exhibit of corkwood.**113. Department of Public Works, Portuguese Government (Department of Forests).**

WOODS, TIMBER, ROSIN, TURPENTINE, AND IMPLEMENTS.

*Report.*—Commended for the general excellence of the exhibit, which contains tree-sections, planks, rosin, turpentine, implements, ship timbers, corkwoods, and tan-barks.**114. Imperial Government of Brazil.**

FOREST PRODUCTS.

*Report.*—Commended for the magnitude and variety of the collective exhibit, the excellence of the forest products, and the care and accuracy shown in their preparation and classification.



**115. Company of Lezirias do Tego and Sado, Lisbon, Portugal.**

CORKWOOD.

*Report.*—Commended for the variety and excellent quality of the exhibit.**116. Natural History Society of the City of Mexico, Mexico.**

COLLECTIVE EXHIBIT OF FOREST PRODUCTS.

*Report.*—Commended for the special excellence and variety of the exhibit, which contains fifty-six species of woods, bombax down ("tree cotton"), vegetable wax and the plants which produce it; gums, fibres, medicinal plants, copals, mesquit gum, resins, and incense bark.**117. Director of the Botanic Gardens of Melbourne, Victoria, Australia.**

COLLECTIVE EXHIBIT OF GUMS, RESINS, VEGETABLE FAT, AND CAOUTCHOUC.

*Report.*—Commended for the interest and fullness of the exhibit, which is accompanied with a report with the common and botanic names of the species producing the articles.**118. Colonial Government of the Cape Verde Islands, Portuguese Colonies.**

COLLECTIVE EXHIBIT OF FOREST PRODUCTS, CONSISTING OF WOODS, GUMS, COPALS, LICHENS (ARCHILS), AND MEDICINAL HERBS.

*Report.*—Commended for the variety and extent of the exhibit and excellence of many of the products, specially of archils.**119. Colonial Government of Angola, Portuguese Colonies.**

COLLECTIVE EXHIBIT OF WOODS, LICHENS, AND GUMS.

*Report.*—Commended for the size, beauty, completeness, and general interest of the exhibit, which contains many native woods, thirteen jars of samples of lichens for dyes, about fifty jars of samples of gums, resins, and copals (the latter specially fine), and nearly one hundred jars of medicinal barks and herbs.**120. Colonial Government of Goa, Portuguese Colonies in India.**

COLLECTIVE EXHIBIT OF FOREST PRODUCTS, CONSISTING OF WOODS, GUMS, LICHENS, AND MEDICINAL BARKS AND HERBS.

*Report.*—Commended for the excellence and variety of the exhibit.**121. Colonial Government of Mozambique, Portuguese Colonies.**

COLLECTIVE EXHIBIT OF FOREST PRODUCTS, CONSISTING OF WOODS, GUMS, LICHENS FOR DYE, AND VEGETABLE WAX.

*Report.*—The exhibit is not large, but of much interest, because of the nature and quality of the articles.**122. Department of Public Works, District of River Mondego, Portugal.**

TAN BARKS.

*Report.*—A specially interesting exhibit of barks, of nearly a dozen species, from cultivated (artificially planted) trees.**123. Municipal Chamber of Penafiel, Oporto, Portugal.**

ALMONDS, FILBERTS, AND WALNUTS.

*Report.*—Commended for the excellence of quality and reasonable prices of the samples exhibited.

**124. Russian Society of Forestry, St. Petersburg, Russia.****SEEDS OF FOREST TREES.**

*Report.*—Seeds of twenty-four species of European forest trees, in fine condition.

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**125. Provincial Committee, Amazon, Brazil.****NUTS AND FRUITS.**

*Report.*—A fine exhibit of Brazil nuts and guarana fruits, the latter used in making cooling drinks.

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**126. Provincial Committee, Pará, Brazil.****RESINS AND NUTS.**

*Report.*—Commended for the variety and excellence of the exhibit of resins and the fine specimens of nuts.

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**127. Provincial Committee, Ceará, Brazil.****ARTICLES MADE FROM COPERNICA CERIFERA.**

*Report.*—An interesting exhibit of wax and other products of the above tree.

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**128. Eastern Burnettizing Company, Boston, Mass., U. S.****SAMPLES OF BURNETTIZED TIMBER.**

*Report.*—Commended for the soundness and texture of the specimens of timbers of several sorts, after having been in use for periods of eleven to nineteen years.

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**129. Council of Agriculture of Quebec, Montreal, Canada.****SUNDRY FIELD SEEDS.**

*Report.*—A nice exhibit of beans, peas, and linseed.

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**130. The Colonial Commission of New Zealand, by Dr. Hector.****SAMPLES OF KAURI GUM.**

*Report.*—This collection embraces a large number of specimens of kauri gum, some of great size, representing eight varieties of gum. It is the only important exhibit of kauri gum in the Exhibition.

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**131. Advisory Board of Manitoba, Manitoba, British America.****SEEDS, WILD HOPS, AND WILD TEA.**

*Report.*—The exhibit is not a large one, but is of much interest because of the locality and the nature of the products.

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**132. Advisory Board of Ontario, Ontario, Canada.****SUNDRY SEEDS OTHER THAN CEREALS.**

*Report.*—Commended for the excellence and variety of the exhibit, which contains more than seventy exhibits of peas, besides many of beans and linseed, many of special excellence; the exhibit in peas, beans, and linseed being of special excellence.

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**133. Advisory Board of Nova Scotia, Halifax, Nova Scotia.****VARIOUS SEEDS OTHER THAN CEREALS.**

*Report.*—Commended for the excellence of the exhibit.

## 134. Advisory Board of Nova Scotia, Halifax, Nova Scotia.

## EXHIBIT OF SEEDS.

*Report.*—Linseed and other seeds in the collective exhibit, which contains much not referred to this group; the linseed recommended for excellence. The collective exhibit of seeds and grains is generally good.

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## 135. Dr. Hector, Director of the Colonial Museum, New Zealand.

## BARKS FOR TANNING.

*Report.*—The collection includes eight barks and one wood used or tested for tanning in New Zealand. Dr. Hector has carefully determined the amount of tannin in each of these by a laborious and important investigation.

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## 136. Maximo Alonso Prado, Leon, Spain.

## COLLECTION OF WALNUTS AND FILBERTS.

*Report.*—Commended for the excellence of both of the articles.

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## 137. A. P. Baer &amp; Co., Baltimore, Md., U. S.

## QUERCITRON AND CHESTNUT-OAK BARK.

*Report.*—Commended for the excellence of the exhibit.

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## 138. J. H. Allen, Pictou, Prince Edward's County, Ontario, Canada.

## FIFTEEN VARIETIES OF PEAS.

*Report.*—The exhibitor has made a specialty of this crop, and the exhibit is specially meritorious in variety and quality.

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## 139. Wm. Rennie, Toronto, Canada.

## GARDEN AND OTHER SEEDS.

*Report.*—The exhibit is not large (about one hundred kinds), but the samples are in especially good condition.

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## 140. Hadji Moustapha, Aleppo, Syria, Turkey.

## GALL-NUTS.

*Report.*—Commended for the excellence of the material.

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## 141. Hugo Finck, Cordova, Mexico.

## CINCHONA FROM CULTIVATION.

*Report.*—This is the only private exhibit of cultivated cinchona in the Exhibition. He shows specimens of three species, both in herbarium specimens and the commercial bark.

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## 142. Andoorik, Angora, Turkey.

## GUM TRAGACANTH.

*Report.*—Commended for the specially fine quality of the exhibit.

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## 143. Abdourahman Agha, Aleppo, Syria, Turkey.

## PISTACHIO NUTS.

*Report.*—Commended for the excellence of the article.

**144. H. E. Faik Pacha, Constantinople, Turkey.**

"ROSIN (GUM) SCAMMONY."

*Report.*—Commended for the purity of the sample and its great size.**145. Nuñez & Co., Lisbon, Portugal.**

CORKS.

*Report.*—Commended for size, quality, and variety.**146. Stavri (Oglore), Province of Castamouni, Turkey.**

SALEP.

*Report.*—Commended for excellence and purity.**147. Herm. A. Holstein, Constantinople, Turkey.**

COLLECTIVE EXHIBIT OF GUMS AND GALL-NUTS.

*Report.*—Commended for the variety and quality of the exhibit, which contains various gums, the products of Turkey and Syria; gall-nuts and berries for dyes.**148. Salema Mattos & Co., Lisbon, Portugal.**

CORKS.

*Report.*—Commended for good quality and variety.**149. C. Menezes & Co., Oporto, Portugal.**

CORKWOOD AND CORKS.

*Report.*—Commended for thickness and elasticity of the corkwood, and the size and variety of manufactured corks.**150. J. Augusto d'Orb, Portalegre, Portugal.**

CORKWOOD.

*Report.*—Commended for elasticity and integrity of texture.**151. João Mascarenhas Netto, Faro, Portugal.**

CORKWOOD AND CORKS.

*Report.*—Commended for the quality and variety of the exhibit, both of corkwood and manufactured corks.**152. Manoel Fernandes de Mendonca, Lisbon, Portugal.**

CORKS.

*Report.*—A small exhibit of vial corks, of very fine quality.**153. Juan Lagrife, Lisbon, Portugal.**

CORKS.

*Report.*—Commended for size and quality of the exhibit.**154. Conde das Galveias, Azaruja, Evora, Portugal.**

CORKWOOD.

*Report.*—Commended for smoothness and elasticity.

## 155. Caetano Manoel Cordeiro, Redondo, Evora, Portugal.

CORKWOOD.

*Report.*—Commended for general excellence of quality.

## 156. Dr. Antonio Joaquim Frausto, Montalvao, Portalegre, Portugal.

CORKWOOD.

*Report.*—Commended for elasticity and smoothness.

## 157. Dr. Thomas Antonio Pinto Soares, Albergaria, Aveiro, Portugal.

CORKWOOD.

*Report.*—Commended for elasticity, smoothness, and integrity of texture.

## 158. Francisco Simoes Margiochi, Jr., Lisbon, Portugal.

CORKWOOD.

*Report.*—Commended for elasticity, integrity of texture, and smoothness.

## 159. Joaquim Guilherme Vasconcellos &amp; Sa, Elvas, Portalegre, Portugal.

CORKWOOD.

*Report.*—Commended for integrity of texture, smoothness, and elasticity.

## 160. Antonio Calca &amp; Pina, Souzel, Portalegre, Portugal.

CORKWOOD.

*Report.*—Commended for integrity of texture and smoothness.

## 161. Antonio Garcia de Andrade, Elvas, Portalegre, Portugal.

CORKWOOD.

*Report.*—Commended for smoothness and elasticity.

## 162. Ramiro Cezar Murta, Castello de Vide, Portalegre, Portugal.

CORKWOOD.

*Report.*—Commended for smoothness and elasticity.

## 163. P. Moreno &amp; Sons, Portalegre, Portugal.

CORKWOOD AND CORK.

*Report.*—Commended for the smoothness, elasticity, and integrity of texture of the cork-wood, and the size and variety of the exhibit of manufactured corks.

## 164. Joaquim Fernandes, Mogão, Santarem, Portugal.

CORKWOOD.

*Report.*—Commended for elasticity, smoothness, and integrity of texture.

## 165. Manuel F. de Aro Jorge, Province of Alagoas, Brazil.

TANNING MATERIAL.

*Report.*—A very interesting exhibit of the fruit of the *Canna fistula* (*Cacia Brasiliana*), a material used locally for tanning.

## 166. Alexander Zapevalof, St. Petersburg, Russia.

FIELD AND GARDEN SEEDS.

*Report.*—Commended for variety and purity.

## 167. Dookhinof Bros., St. Petersburg, Russia.

LINSEED.

*Report.*—Commended for excellence.

## 168. Kazan Model Farm, near Kazan, Russia.

LINSEED.

*Report.*—Commended for excellence.

## 169. Leopold Ritter, Moscow, Russia.

GARDEN AND FIELD SEEDS.

*Report.*—Commended for variety and purity.

## 170. E. Gratchef, St. Petersburg, Russia.

FIELD AND GARDEN SEEDS.

*Report.*—Commended for variety and purity.

## 171. Paul Obratnof, Uralsk, Russia.

LINSEED.

*Report.*—Commended for linseed particularly good.

## 172. Marinska Model Farm, near Saratov, Russia.

PEAS, BEANS, AND HEMP AND POPPY SEED.

*Report.*—Commended for excellence and variety.

## 173. Bessarabian Horticultural School, Kishinef, Russia.

LINSEED AND SUNFLOWER SEED.

*Report.*—Commended for fine quality and purity.

## 174. Theodore Levshin, St. Petersburg, Russia.

PEAS AND RAPE-SEED.

*Report.*—Commended for fine quality.

## 175. Alexis Ermolof, Arkhangelskoie, near Voronesh, Russia.

PEAS.

*Report.*—Commended for excellence.

## 176. Henrietta Dengink, Kishinef, Bessarabia, Russia.

GARDEN SEEDS.

*Report.*—Commended for the fine quality of the seed.

**177. Jas. M. Thorburn & Co., New York, N. Y., U. S.**

## GARDEN SEEDS AND TREE SEEDS.

*Report.*—Commended for the size and interest of the exhibit, containing, besides garden and nursery seeds, a very large collection of the seeds of American forest trees and shrubs.

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**178. Peter Henderson & Co., New York, N. Y., U. S.**

## FIELD AND GARDEN SEEDS.

*Report.*—Commended for size, variety, and excellence of the exhibit.

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**179. Robert Buist, Jr., Philadelphia, Pa., U. S.**

## GARDEN SEEDS.

*Report.*—Commended for the variety and purity of the exhibit (about two hundred and fifty samples).

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**180. Miller, Sievers, & Co., San Francisco, Cal., U. S.**

## CONES OF CALIFORNIA CONIFERÆ.

*Report.*—A large collection, and very nearly complete, of the cones of Californian cone-bearing trees; a fine collection, and one peculiarly difficult to make.

---

**181. Austin G. Day, Seymour, Conn., U. S.**

## RUBBER-PRODUCING PLANTS.

*Report.*—A collection of fifty plants, more than twenty different species, of rubber-producing plants, from various portions of the world, as well as those grown by the exhibitor.

---

**182. Smythe, Earle, & Co., New York, N. Y., U. S.**

## CRUDE INDIA-RUBBER, NATIVE TREES, AND IMPLEMENTS.

*Report.*—A very complete collection of raw rubber from many countries, together with the sap and the apparatus used in collecting it from the trees.

---

**183. Thomas Meehan, Germantown, Philadelphia, Pa., U. S.**

## SEEDS OF AMERICAN TREES AND SHRUBS.

*Report.*—Commended for the completeness of the exhibit. It is certainly the largest in this Exhibition.

---

**184. M. Thams & Co., Orkedal, Norway.**

## TIMBER AND WORKED LUMBER.

*Report.*—A fine commercial exhibit of planks, deals, mouldings, and staves, together with cases for fish and sections of trees. Shows good material and excellent workmanship.

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**185. J. C. Arthur, Charles City, Iowa, U. S.**

## HERBARIUM OF PLANTS OF IOWA.

*Report.*—The herbarium contains species neatly mounted and labeled, and the most are in duplicate; the duplicate collection ingeniously arranged for exhibition on large sliding frames within a glass case; the whole accompanied by a printed catalogue.

186. **Elias José Nunes, Pará, Brazil.**

RAW RUBBER.

*Report.*—An exhibit of very fine Pará rubber.187. **Raymundo José Rabello, Pará, Brazil.**

RAW RUBBER.

*Report.*—An exhibit of very fine Pará rubber.188. **J. Ming Hayward, Bermuda Islands.**

ARROW-ROOT.

*Report.*—An interesting and complete exhibit of arrow-root, both raw and manufactured.189. **R. H. Sawyer & Co., Bahama Islands.**

WOODS AND TIMBERS, DYE-WOODS, VEGETABLE WAX, AND BARKS.

*Report.*—Commended for the variety and excellence of the articles.190. **Behn, Meyer, & Co., Singapore, English Colonies.**

GUTTA-PERCHA.

*Report.*—An excellent collection of gutta-percha (raw) of various qualities.191. **H. R. Hitchcock, Hawaii, Sandwich Islands.**

MOSES AND LICHENS OF THE SANDWICH ISLANDS.

*Report.*—Commended for the magnitude of the collection and the tasteful manner in which the specimens are prepared and mounted.192. **Miss C. B. Andrews, Hawaii, Sandwich Islands.**

FERNS OF THE ISLAND OF HAWAII.

*Report.*—Commended for the large number of species represented in the collection (one hundred), and the tasteful manner in which they are mounted.193. **Heller & Goldschmidt, Cairo, Egypt.**

GUM ARABIC.

*Report.*—Commended for variety and excellence, eighteen grades represented in good form and sufficient quantity.194. **Wm. B. Burk & Co. (Conestoga Cork Works), Philadelphia, Pa., U. S.**

CORKS.

*Report.*—A fine commercial exhibit of manufactured corks, arranged in grades and classified, showing great variety and excellent workmanship.195. **Dr. C. Martin, Ancud, Chiloe, Chili.**

HERBARIUM OF MEDICINAL PLANTS OF CHILOE.

*Report.*—It is an interesting and large collection, carefully arranged and named.



## 196. J. C. Baird, Cooktown, Queensland, Australia.

WATTLE BARK FOR TANNING.

*Report.*—Commended as a good exhibit.

## 197. Biester, Campos, &amp; Co., Lisbon, Portugal.

CORKWOOD.

*Report.*—Commended for size, thickness, and integrity of texture

## 198. F. A. Hulskamp, Amsterdam, Netherlands.

CORK.

*Report.*—A fine commercial exhibit, showing great variety and excellence of manufactured specimens.

## 199. John Chambers, Auckland, New Zealand.

PRESSED FERNS.

*Report.*—Commended for the beauty and interest of the exhibit, which consists of fifty-four species of ferns collected in the Auckland Province, artistically arranged, mounted, and framed.

## 200. Stantien &amp; Becker, Berlin and Königsberg, Prussia.

AMBER.

*Report.*—Commended for the magnitude and variety of the exhibit, and the good quality of the material.

## 201. J. Kleintjes, Rotterdam, Netherlands.

NATURAL HEDGE GRAFTING.

*Report.*—A very successful example of natural grafting of hedge-plants, showing much skill in its construction.

## 202. Vilarinho &amp; Nephew, Silves, Faro, Portugal.

CORKWOOD AND CORKS.

*Report.*—Commended for extent, variety, and excellence.

## 203. Mossop &amp; Garland, Cape Town, Cape of Good Hope.

TAN BARKS FROM EIGHT SPECIES.

*Report.*—Commended for the variety of the exhibit and excellence as shown by the leathers exhibited which had been tanned with these varieties.

## 204. José Maria Dantas Pimenta, Torres Novas, Santarem, Portugal.

ALMONDS AND WALNUTS.

*Report.*—Commended for the variety and excellence of the almonds and the size and flavor of the walnuts, and the very moderate prices of both.

## 205. José Maria Ramalho, Evora, Portugal.

CORKWOOD AND CORKS.

*Report.*—Commended for the extent and variety of corkwood and manufactured corks.

## 206. Joaquim Manoel de Mattos Peres, Evora, Portugal.

## CORKWOOD.

*Report.*—Commended for smoothness, elasticity, and integrity of texture.

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## 207. Ascencio José dos Santos, Valença, Vianna do Castello, Portugal.

## TANNING MATERIALS.

*Report.*—A varied and interesting collection of oak, willow, and eucalyptus barks, and also of grape-seeds for the same use.

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## 208. Henrique de Sa Nogueira, Portalegre, Portugal.

## CHESTNUTS.

*Report.*—Commended for excellent quality.

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## 209. João José Le Cocq, Castello de Vide, Portalegre, Portugal.

## ALMONDS AND WALNUTS.

*Report.*—Commended for excellent quality and moderate prices.

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## 210. Francisco Rodrigues Pinheiro, Marvão, Portalegre, Portugal.

## CORKWOOD.

*Report.*—Commended for smoothness, integrity of texture, and elasticity.

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## 211. Peres, Pereira, Fo, &amp; Co., Lisbon, Portugal.

## CORKWOOD.

*Report.*—Commended for the variety and excellence of the commercial exhibit of cork-wood.

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## 212. Dr. Thomas Antonio Pinto Soares, Albergaria, Aveiro, Portugal.

## GRAPE-SEEDS FOR TANNING.

*Report.*—The exhibitor has developed what appears to be an important industry, and exhibits the material with prices.

---

## 213. Excelma. Sra. Duquesa de Medinaceli, Province of Avila, Spain.

## ROSIN AND TURPENTINE, WITH ILLUSTRATIONS OF GROWTH AND MANUFACTURE.

*Report.*—Commended for the completeness and excellence of the exhibit, which consists of a pine trunk, with apparatus for collecting turpentine, implements used; rosin of various grades, some of superior excellence; turpentines of various grades; with map of the forests, statistics of production, and price of the products.

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## 214. A. L. Butz, Philadelphia, Pa., U. S.

## CORKS.

*Report.*—A good exhibit of manufactured corks, assorted sizes, showing good material and great variety.

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## 215. Jaime Coris, Llagostera, Gerona, Spain.

## CORK.

*Report.*—This exhibit contains cork, both in the natural state and manufactured, and is much to be commended on account of the softness and elasticity of the specimens shown. and its integrity of texture.

## 216. José Diaz Agero, Madrid, Spain.

CORK.

*Report.*—This is a fine collection of cork slabs and manufactured cork, showing good material and variety.

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## 217. Dr. Muricy, Paraná, Brazil.

NUTS, ETC.

*Report.*—An interesting and excellent exhibit of products from the Araucaria Brazilianna, consisting of nuts, resin, starch, and coal.

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## 218. Pedro Molano, Badajoz, Spain.

CORK.

*Report.*—A fine exhibit of cork slabs, to be used for champagne corks. The samples are thick, smooth, and elastic, and free from pores.

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## 219. Widow and Son of Esteve, Reus, Tarragona, Spain.

COLLECTIVE EXHIBIT OF WALNUTS AND FILBERTS.

*Report.*—Commended for the excellence of the exhibit.

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## 220. Pedro L. Montenegro, Cáceres, Spain.

CORK.

*Report.*—This is a small collection of cork, of superior quality, and very smooth and elastic.

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## 221. Conde de Torre Diaz, Jerez, Cadiz, Spain.

CORK.

*Report.*—A large collection of cork, showing great variety of grade and character.

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## 222. Hubert Bonzano, New Orleans, La., U. S.

PECANS (NUTS OF CARYA OLIVÆFORMIS).

*Report.*—This exhibit is of fruit of remarkably large size, tenderness of shell, and very special excellence, and has been produced by cultivation and grafting of a native nut, which is usually met with only wild and of a quality very inferior to the exhibit, and brings in market but one-fourth to one-eighth the price named as the selling price of the exhibit.

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## 223. John Rochester, Ottawa, Canada.

PINE LUMBER.

*Report.*—Commended for extent and general good quality.

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## 224. Perley &amp; Pattee, Ottawa, Ontario, Canada.

PINE LUMBER.

*Report.*—Commended for size, good quality, and variety.

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## 225. George Newell, Ottawa, Ontario, Canada.

ASH PILLARS.

*Report.*—Commended for the beauty of material and good workmanship displayed.

## 226. G. B. Hall, Montmorency Mills, Quebec, Canada.

## PINE BOARDS.

*Report.*—A fine exhibit of wide, clear pine boards.

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## 227. H. P. Cusack, Newbury, Ontario, Canada.

## BARREL HOOPS.

*Report.*—Commended for the excellence of material and good workmanship displayed.

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## 228. Levi Young, Ottawa, Ontario, Canada.

## PINE LUMBER.

*Report.*—A large exhibit of fine stock-boards.

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## 229. A. N. Greig, Montreal, Quebec, Canada.

## PAINTED IMITATIONS OF WOOD AND MARBLES.

*Report.*—Commended for the excellence of the imitation, that of the woods being specially good.

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## 230. Bronson J. Weston, Ottawa, Ontario, Canada.

## PINE LUMBER.

*Report.*—Commended for size and quality.

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## 231. Pike &amp; Richardson, Chatham, Ontario, Canada.

## BARREL HOOPS.

*Report.*—Commended for good quality of material and good workmanship.

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## 232. J. G. &amp; L. Frankl, Vienna, Austria.

## VENEERS.

*Report.*—They are a most excellent quality and a considerable variety of veneers, heavy, well cut, mostly of European woods.

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## 233. Quebec Advisory Board, Montreal, Quebec, Canada.

## WORKED LUMBER.

*Report.*—Commended for the variety of the exhibit, and the fine quality of the lumber shown.

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## 234. Wisconsin Central Railroad Co., Wisconsin.

## WOODS AND PLANKS.

*Report.*—This is a good commercial exhibit of planks and blocks taken from timber growing on the line of the road, and contains some very fine specimens.

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## 235. John Baptist Egger, Villach, Austria.

## PARQUETRY FLOORING.

*Report.*—Commended for excellence of workmanship.

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## 236. Francis Steinmetz, Petrouberd, near Eisenerz, Austria.

## PARQUETRY FLOORING.

*Report.*—Commended for excellence of workmanship.

## 237. John Oliver, Toronto, Ontario, Canada.

## WORKED LUMBER.

*Report.*—Commended for variety and excellence.

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## 238. C. J. F. Thijssen, Deventer, Netherlands.

## SIEVE FRAMES.

*Report.*—A large and fine exhibit, showing excellent material and good workmanship.

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## 239. Wagner &amp; Starker, Stuttgart, Germany.

## PARQUETRY FLOORING.

*Report.*—Commended for excellence of workmanship.

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## 240. Georg Schöttle, Stuttgart, Germany.

## PARQUETRY FLOORING.

*Report.*—Commended for excellence of workmanship.

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## 241. James G. Wilson, Washington Heights, New York, N. Y., U. S.

## ROLLING WOOD SHUTTERS.

*Report.*—Commended for manner of construction, good workmanship, and special adaptation for the purposes intended.

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## 242. National Wood Manufacturing Co., New York, N. Y., U. S.

## WOOD-CARPET FLOORING.

*Report.*—Commended for the method of construction, quality of workmanship, and adaptability to use, as well as quality of the woods used and beauty of designs.

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## 243. J. E. Patterson &amp; Co., Pittston, Pa., U. S.

## DOORS, SASH, BLINDS, AND NEWELS.

*Report.*—Commended for excellence of workmanship and material, and the manner in which it is put together.

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## 244. Clark &amp; Co., New York, N. Y., U. S.

## STEEL SHUTTERS.

*Report.*—Commended for good workmanship, convenience, and ease of working.

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## 245. Ivanitzky, Iarow Inlaid Floor Manufactory, Retchitza, Minsk, Russia.

## INLAID FLOORING.

*Report.*—Commended for cheapness combined with excellency of workmanship and beauty of design.

## 246. Thos. Bullivant, London, England.

## SASH WINDOW.

*Report.*—Commended for the following reasons:

1st. The method of construction does much to obviate accidents, as instead of the weight being fastened to the sash directly by a cord, as in the old style of windows, there is a metal guide-bar, which travels in a groove in the window-frame, to which the weight is attached. This is kept in place in the sash by a pin, and the sash can be removed by withdrawing the pin, leaving the guide-bar in the frame.

2d. The guide-bar having a spring-metal packing both on the outside and in the back, the sash is kept firmly in place, will not rattle, and will keep out dust and draughts.

## 247. Fairbanks &amp; Hawes, St. John, New Brunswick, Canada.

## DOORS, SASHES, BLINDS, AND NEWEL POSTS.

*Report.*—Commended for good material used in construction, for excellent workmanship, and for moderate prices.

## 248. Hudson Bros., Sydney, New South Wales, Australia.

## DOORS AND TABLE-LEGS.

*Report.*—Commended for workmanship, durability, and moderate prices; also beauty of woods used in construction.

## 249. Luis Bosch &amp; Gausá, Barcelona, Spain.

## MANUFACTURED CORK.

*Report.*—This is a very fine exhibit of manufactured cork. The specimens are smooth, elastic, very free from woody fibre, and show great integrity of texture.

## 250. J. O. Wengström, Stockholm, Sweden.

## CARPENTER WORK AND MANUFACTURED PARTS OF BUILDINGS.—THE SWEDISH SCHOOL-HOUSE.

*Report.*—Commended for general excellence.

## 251. Baron H. H. von Essen, Tidaholm, Sweden.

## CARPENTER WORK, FRAMES, DOORS, SASHES, AND PANELS.

*Report.*—Commended for excellence of workmanship, beauty and variety of design, and excellence of lumber used.

## 252. James Dickson &amp; Co., Sandarne, Sweden.

## CARPENTER WORK, PLAIN AND ORNAMENTAL.

*Report.*—Commended for excellence and beauty of the work and the quality of the material used.

## 253. Norwegian Commission, Christiania, Norway.

## FITTINGS OF NORWEGIAN DEPARTMENT.

*Report.*—Commended as showing excellent workmanship, good taste, and general fitness for intended purpose.

**254. Charles W. Spurr, Boston, Mass., U. S.****PAPERED WOOD HANGINGS, OR VENEERS.**

*Report.*—Commended for the following reasons :

1st. The sheets of wood being cut very thin and backed by strong paper, can be applied to any smooth surface.

2d. The use of flour paste instead of glue prevents the discoloration of the wood or exaggeration of the grain.

3d. While there is no difference in the appearance of the papered wood hanging from solid wood, the price is much less.

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**255. Anchor Manufacturing Co., Philadelphia, Pa., U. S.****BARRELS AND MATERIALS FOR MAKING BARRELS.**

*Report.*—Commended (1) on account of strength. These barrels being made of one sheet of wood with alternate gores, the staves cannot either rack or start.

(2.) Tightness : the size of the croze and gores and the thickness and length of the stave being regulated by machinery, a perfect fit is secured when the parts are brought together ; this also secures perfect uniformity of size.

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**256. George J. Burkhardt & Co., Philadelphia, Pa., U. S.****CEDAR VATS, TANKS, AND DYE-TUBS.**

*Report.*—Commended for excellence of material and construction.

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**257. United States Department of Agriculture, Botanical Division, Washington, D. C., U. S.****COLORED DRAWINGS OF FUNGI.**

*Report.*—Commended for the magnitude of the collection—four hundred and thirty-six plates—and the truth and beauty of the drawings.

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**258. United States Department of Agriculture, Botanical Division, Washington, D. C., U. S.****COLLECTION OF WOODS OF THE UNITED STATES.**

*Report.*—Commended for the magnitude of the collection—four hundred species—represented by nearly one thousand specimens of trunk, leaf, flower, and fruit, and the accuracy and taste with which it has been arranged. All of which renders it by far the finest exhibit of forest trees in the Exhibition.

## SIGNING JUDGES OF GROUP VI.

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The figures annexed to the names of the Judges indicate the reports written by them respectively.

WM. H. BREWER, 11, 12, 14, 15, 16, 17, 19, 20, 21, 23, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 41, 42, 43, 45, 46, 50, 53, 59, 62, 65, 66, 67, 68, 69, 70, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 95, 97, 99, 100, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 113, 116, 117, 118, 119, 120, 121, 122, 124, 128, 129, 131, 132, 133, 134, 136, 137, 138, 139, 140, 141, 142, 143, 144, 146, 147, 165, 166, 167, 168, 169, 170, 171, 172, 175, 177, 178, 179, 180, 183, 185, 189, 193, 195, 196, 199, 203, 207, 212, 213, 219, 222, 229, 232, 235, 236, 239, 240, 242, 243, 245, 250, 251, 252, 256.

J. M. BENNETT, 48.

J. S. NEWBERRY, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 26, 94, 114, 130, 135, 191, 192, 200, 257, 258.

JNO. R. WEST, 13, 18, 22, 24, 37, 38, 39, 40, 44, 47, 49, 51, 52, 54, 55, 56, 57, 58, 60, 61, 63, 64, 71, 72, 73, 96, 98, 101, 112, 115, 123, 125, 126, 127, 145, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 173, 174, 176, 184, 188, 194, 197, 198, 201, 202, 204, 205, 206, 208, 209, 210, 211, 214, 215, 216, 217, 218, 220, 221, 223, 224, 225, 226, 227, 228, 230, 231, 233, 234, 237, 238, 241, 244, 246, 247, 248, 249, 253, 254, 255.

W. H. CHANDLER, 181, 182, 186, 187, 190.



SUPPLEMENT TO GROUP VI.

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REPORTS  
OF  
JUDGES ON APPEALS.

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JUDGES.

JOHN FRITZ, Bethlehem, Pa.  
EDWARD CONLEY, Cincinnati, Ohio.  
CHARLES STAPLES, JR., Portland, Me.  
BENJ. F. BRITTON, New York City.  
H. H. SMITH, Philadelphia, Pa.

COLEMAN SELLERS, Philadelphia, Pa.  
JAMES L. CLAGHORN, Philadelphia, Pa.  
HENRY K. OLIVER, Salem, Mass.  
M. WILKINS, Harrisburg, Oregon.  
S. F. BAIRD, Washington, D. C.

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1. Daniel Holton, Portland, Oregon, U. S.

VENEERS OF OREGON MAPLE.

*Report.*—Commended for rare beauty, extreme fineness of grain, beautiful polish, toughness of fibre, and value for ornamental and cabinet work.

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2. Commercial Association of Oporto, Oporto, Portugal.

CARVED TRIMMINGS FOR INSIDE DOORS AND OTHER WORK, OF CHESTNUT AND OTHER WOODS.

*Report.*—Commended for good taste in design, skill in execution, and fitness for purpose intended.

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3. Direction of Public Works of the District of Oporto, Oporto, Portugal.

CUBIC BLOCKS OF HARD WOODS, EQUAL IN SIZE, USED BY EXHIBITORS IN PUBLIC WORKS IN OPORTO, PORTUGAL.

*Report.*—Commended for endurance, utility, and fitness for purpose intended.

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4. Direction of Public Works of the District of Vianna do Castello, Vianna do Castello, Portugal.

CUBIC BLOCKS OF HARD WOODS, OF VARIOUS SIZES, USED IN PUBLIC WORKS OF VIANNA DO CASTELLO, PORTUGAL.

*Report.*—Commended for utility, endurance, and fitness for the purpose intended.

5. Geo. S. McGregor, Cleveland, Ohio, U. S.

GRAINING IN OAK, WALNUT, AND ROSEWOOD.

*Report.*—Commended for artistic skill, utility, and fitness for purpose intended.

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6. A. Wilt & Son, Philadelphia, Pa., U. S.

DOORS, SASHES, AND BLINDS.

*Report.*—Commended for thorough excellence and fidelity of workmanship.

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SIGNING JUDGES OF SUPPLEMENT TO GROUP VI.

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The figures annexed to the names of the Judges indicate the reports written by them respectively.

M. WILKINS, 1, 6.

HENRY K. OLIVER, 2, 3, 4, 5.



## GROUP VII.

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FURNITURE, UPHOLSTERY, WOODEN-WARE,  
BASKETS, ETC.

## GROUP VII.

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### J U D G E S.

#### AMERICAN.

ADDISON BOYDEN, Boston, Mass.

CHAUNCEY WILTSE, Omaha, Neb.

ROBERT MITCHELL, Cincinnati, Ohio.

#### FOREIGN.

LE MARQUIS EUGÈNE ACHILLE DE  
ROCHAMBEAU, France.

THEODORE SNYERS FILS, Belgium.

FRANÇOIS THONET, Austria.

## GROUP VII.

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### FURNITURE, UPHOLSTERY, WOODEN-WARE, BASKETS, ETC.

CLASS 217.—Household, office, and church furniture.

Upholstery, curtain fixtures, shades, etc.

CLASS 220.—Mirrors, gilt cornices, brackets, picture frames, etc.

CLASS 221.—The nursery and its accessories,—children's chairs, walking chairs.

CLASS 289.—Wooden and basket ware, papier maché.

CLASS 227, No. 11.—Parquetry work, etc.

CLASS 225.—Laundry appliances,—washing machines, mangles, clothes-wringers, clothes-bars, ironing-tables.

CLASS 226.—Apparatus and appliances of the bath room and water closet,—shower bath, earth closet, etc.

CLASS 290.—Undertakers' furnishing goods,—caskets, coffins, etc.



# GENERAL REPORT

OF THE

## JUDGES OF GROUP VII.

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BOSTON, November 18, 1876.

PROF. FRANCIS A. WALKER, *Chief of the Bureau of Awards:*

SIR,—The undersigned, Chairman of the Board of Judges for Group VII., tenders the following general report of the labors of the Committee in connection with the United States Centennial Exhibition.

As Chairman of this Committee, I feel that I should fall short of my duty if I should dismiss this report without testifying to the pleasant relations existing between myself and my associates upon the Board during our brief official connection.

ADDISON BOYDEN, *Chairman.*



## GROUP VII.

FURNITURE, UPHOLSTERY, WOODEN-WARE,  
BASKETS, ETC.

BY ADDISON BOYDEN.

The Committee, consisting of Messrs. Robert Mitchell, Cincinnati, Ohio; Chauncey Wiltse, Omaha, Nebraska; the Marquis de Rochambeau, France; Theodore Snyers, Jr., Belgium; Francis Thonet, Austria; and Addison Boyden, Boston, Massachusetts, met at Judges' Hall on the 25th day of May, 1876, and organized by the choice of Addison Boyden as Chairman, and Theodore Snyers, Jr., as Secretary.

We immediately entered upon a careful examination of the exhibits embraced in the group, our unremitting labors extending over a period of eight weeks; and we gladly place upon record our judgment that, while we wish we could have seen a more extended and representative display of the world's manufacture of articles of domestic utility and ornament, the collection was a meritorious one in very many respects, and it is our conviction that the exhibition in this group, limited though it was to the productions of only a few of the manufactories of the principal nations, can but be beneficial in its effects, not only in its influence upon the special branches of industry represented, but also as an educator in decorative art.

Whatever in the realm of utility or beauty makes our homes more attractive and inviting should be welcomed by all lovers of social, moral, and national progress. In this direction your Committee unhesitatingly pronounce this exhibition of household productions to be far in advance of anything heretofore shown, and strongly indicative of an increasing desire on the part of the public for something in the way of house-furnishing beyond the demands of mere necessity and use. It marks a new era in popular taste, healthy in its tone and elevating in its character.

The exhibits of different nationalities were stamped with national characteristics. The English furniture was noticeable for solidity and honest construction, the French for artistic graceful outlines and luxurious appearance, the Austrian and German for care and finish in details, the Chinese and Japanese for quaint and elaborate carving, the American for the superiority of machine-work. These and other

points of excellence classified the work even more particularly than its location in sections. The genius and characteristics of the people were present in their productions, affording a pleasant and ever-changing variety. The products of our domestic factories were in many cases striking examples of the progress made within a few years in the adaptation to fine work of mechanical appliances and labor-saving inventions. It seemed hardly credible to many foreign visitors that the work of certain houses was, as claimed, machine-work. They were, however, not only shown the finished productions, but were invited to visit the factories and watch the processes, in order that they might carry home to their people a clear understanding of our methods.

In this application of machinery the United States occupy a high position. We have much to learn from abroad in detail of design, and in fineness and delicacy of carving, but in economical mechanical appliances, and in the production of furniture suggestive of comfort and luxury, we are second to no other country; and in justice to some of our manufacturers, whose contributions attracted much attention, we must add that, as illustrations of a rapid advance to a high grade in artistic decorative art, these houses can compete with the best in foreign lands.

A noticeable feature in the furniture exhibits was the great number of specialties. Most of these belonged to the United States section, and, being almost entirely unknown abroad, their striking novelty and practical usefulness awakened a marked interest among foreign visitors.

It is due to all parties to say that the fact of the comparatively limited display, previously referred to, was attributable to the lack of sufficient space for exhibition purposes, and we are informed that could this difficulty have been overcome the catalogue of exhibitors, and especially those in the United States, would have been very much increased. It is to be regretted that this occurred, for had a fair representative assortment of furniture, from all the nations of the world, been exhibited, it would have proved one of the most attractive features of the Exhibition.

The collection that your Committee examined, however, was a uniformly good one. The absence of inferior examples of work was frequently remarked. Comparatively few exhibits were shown that were not meritorious in some respect, and consequently the Committee made three hundred and seventeen recommendations for award, that being a very large percentage of the whole number of exhibits.



# REPORTS ON AWARDS.

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## GROUP VII.

### 1. J. E. Lord & Co., Quincy, Ill., U. S.

#### METALLIC SPRING BED BOTTOM.

*Report.*—An elastic, noiseless, and inexpensive spring bed.

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### 2. The Henry J. Seymour Chair Co., Troy, N. Y., U. S.

#### CHAIRS.

*Report.*—Commended for strength, lightness, and durability in chairs of bent wood, for novelty and comfort in upholstered chairs, and for moderate prices.

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### 3. United States Spring Bed Co., Springfield, Mass., U. S.

#### SPRING BED.

*Report.*—A light, clean, durable, and comfortable spring bed.

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### 4. Charles M. O'Hara, Philadelphia, Pa., U. S.

#### HYGIENIC CHAIR.

*Report.*—Commended as successfully designed to support the back, and to remove the liability to spinal difficulties.

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### 5. A. J. Goodwin, Brookline, Mass., U. S.

#### BEDSTEAD ARRANGED FOR SICK-ROOM.

*Report.*—Commended for originality in design and construction; also for its peculiar adaptation for sanitary purposes, being simple in its adjustable arrangements. It is highly recommended for its usefulness and cheapness.

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### 6. George Knell & Son, Philadelphia, Pa., U. S.

#### PARLOR SOFA-BED AND OTHER FURNITURE.

*Report.*—Commended for originality of design and multiplicity of changes provided for in the construction of the various exhibits.

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### 7. Daniel Pabst, Philadelphia, Pa., U. S.

#### A LARGE WALNUT SIDEBORD.

*Report.*—Commended for utility, durability, and beauty.

## 8. A. Cutler &amp; Son, Buffalo, N. Y., U. S.

## CARD TABLE.

*Report.*—Commended as an original and well-designed card table.

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## 9. Giuseppe Ferrari, New York, N. Y., U. S.

## FURNITURE.

*Report.*—Commended for good design, superior carving, and fine workmanship.

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## 10. Seidler &amp; May, Hartford, Conn., U. S.

## SOFA-BED.

*Report.*—Commended for original design, easy adjustment, and simplicity of construction.

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## 11. Allen &amp; Brother, Philadelphia, Pa., U. S.

## FURNITURE AND PARLOR DOORS.

*Report.*—Commended for originality of design, method of construction as tending to durability, and superior workmanship and finish.

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## 12. Moore, York, &amp; Howell, Philadelphia, Pa., U. S.

## WALNUT PARLOR SUIT, CENTRE TABLE, AND GAME TABLE.

*Report.*—Commended for fine quality of workmanship and finish of cabinet work, and thoroughness of upholstery work.

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## 13. Robert M. Wagan, Society of Shakers, Mount Lebanon, N. Y., U. S.

## CHAIRS.

*Report.*—Commended for good workmanship and quality of material; also for lightness, strength, and modest beauty of the chairs.

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## 14. Smith &amp; Campion, Philadelphia, Pa., U. S.

## FOUR COMPLETE SETS OF FURNITURE, VIZ., PARLOR, LIBRARY, DINING-ROOM, AND BED-ROOM.

*Report.*—Commended for original design, superior workmanship, good material, durability, and faithful execution.

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## 15. Peter C. Doremus, New York, N. Y., U. S.

## SOFA SPRING BED AND LOUNGE.

*Report.*—Commended for usefulness and comfort, combined with cheapness.

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## 16. James T. Allen &amp; Co., New York, N. Y., U. S.

## LORD'S PATENT ROCKING CHAIR.

*Report.*—Commended for originality in design and very reasonable price.

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## 17. J. B. M. Fifield, Philadelphia, Pa., U. S.

## BED SOFAS.

*Report.*—Commended for simplicity, and for the introduction of loose covering, to protect the bed when in use; also for the facilities for changing from lounge to bed.

**18. Delaware Chair Co., Delaware, Ohio, U. S.**

DOUBLE CANE OR RATTAN CHAIRS.

*Report.*—Commended for utility, strength, comfort, and cheapness.**19. Walter Heywood Chair Co., Fitchburg, Mass., U. S.**

WOOD AND CANE-SEAT CHAIRS.

*Report.*—Commended for style, durability, finish, and adaptability to meet the wants of the masses.**20. Philander Derby, Gardner, Mass., U. S.**

CANES-SEAT CHAIRS.

*Report.*—Commended as strong, serviceable, and cheap work.**21. B. Thole, St. Louis, Mo., U. S.**

BOOK-CASE.

*Report.*—Commended for excellent design and finish.**22. L. H. Sawin & Co., Gardner, Mass., U. S.**

CANES-SEAT CHAIRS.

*Report.*—Commended for quality, style, and finish.**23. Berkey & Gay Furniture Co., Grand Rapids, Mich., U. S.**

CHAMBER SUIT.

*Report.*—Commended for good work, carefully selected material, and superiority in the details of manufacture.**24. George A. Schastey, New York, N. Y., U. S.**

FURNITURE.

*Report.*—Commended for artistic design and practicability; also for thorough workmanship and excellent finish.**25. Demarest, Joyce, & Co., Brooklyn, N. Y., U. S.**

OPERA CHAIRS.

*Report.*—Commended as an assortment of opera chairs, for combining strength and economy of space.**26. Phoenix Furniture Co., Grand Rapids, Mich., U. S.**

TWO BEDROOM SUITS.

*Report.*—Commended for good workmanship and finish, and for adaptation to the demands of the market for which it is manufactured; a fine exhibit.**27. Heywood Brothers & Co., Gardner, Mass., U. S.**

CHAIRS AND SETTEES.

*Report.*—Commended for the perfection acquired in the use of bent wood, thereby securing strength and reducing weight; also for closely woven rattan work; also for reversible car seat; and for general excellence in manufacture and finish.

## 28. Henry A. Turner &amp; Co., Boston, Mass., U. S.

## STUFFED PARLOR SUIT.

*Report.*—Commended for superior workmanship in upholstering, and for comfortable furniture made from the best materials.

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## 29. Nelson, Matter, &amp; Co., Grand Rapids, Mich., U. S.

## BEDSTEAD AND DRESSING CASE.

*Report.*—Commended for good workmanship and finish, and choice selection of material.

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## 30. J. Chandler Roach, Philadelphia, Pa., U. S.

## PATENT BEDSTEAD.

*Report.*—Commended as a spring bedstead which is convenient, compact when taken apart, and very light, weighing only thirty pounds; very useful, and also clearly original.

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## 31. George Ahrens, Crete P. O., Will Co., Ill., U. S.

## AHRENS'S PATENTED EXTENSION TABLE.

*Report.*—Commended for originality in design of an extension table having a compartment within it for storing the leaves, thereby securing economy of room; also for very superior work in inlaid tops.

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## 32. Matthew De Bock, South Boston, Mass., U. S.

## CABINET AND OTHER ARTICLES OF FURNITURE.

*Report.*—Commended as superior work manufactured by himself from his own original designs, remarkable for carefulness in detail of construction and engraving, and being fine examples of genius and skill.

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## 33. Charles A. Pease, Boston, Mass., U. S.

## PATENT WASHSTAND.

*Report.*—Commended for originality in principle, combined with usefulness and convenience.

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## 34. Henry F. Hover, Philadelphia, Pa., U. S.

## MAGIC FOLDING LOUNGE AND BED.

*Report.*—Commended as a simple and easily adjusted sofa bed, also a lounge, and each so constructed as to combine all the qualifications needful for the uses intended.

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## 35. Lewis Postawka &amp; Co., Cambridge, Mass., U. S.

## PIANO STOOL.

*Report.*—Commended for ingenuity of construction, firmness, and immovability when in use.

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## 36. Daniel M. Karcher's Sons, Philadelphia, Pa., U. S.

## DINING-ROOM SIDEBBOARD.

*Report.*—Commended for good workmanship and finish.

## 37. Gardner &amp; Co., New York, N. Y., U. S.

SEATS FOR CHAIRS, SETTEES, AND RAILWAY CARS.

*Report.*—Commended as neat and serviceable perforated wood-seating for halls, churches, railway cars, and general use, combining great durability with reasonable price.

## 38. New Haven Folding Chair Co., New Haven, Conn., U. S.

PORTABLE FOLDING CHAIRS.

*Report.*—Commended for simplicity and portability.

## 39. Heiligman &amp; Brother, Philadelphia, Pa., U. S.

CARVED BUREAU HANDLES, AND CABINET CARVINGS.

*Report.*—Commended for perfection in workmanship, variety in design, and cheapness.

## 40. Herts &amp; Co., New York, N. Y., U. S.

A COMPLETELY FURNISHED BEDROOM, COMPRISING RICH MAPLE, MAHOGANY, AND AMARANTH BEDSTEAD.

*Report.*—Commended for superiority of workmanship combined with excellence of design and carefulness of finish in cabinet work, and upholstery executed with taste, skill, and thoroughness. All good.

## 41. O. C. White, Hopkinton, Mass., U. S.

ADJUSTABLE HEAD-REST, ATTACHED AND PORTABLE, FOR CHAIRS.

*Report.*—Commended for its uniformity of motion, simplicity of construction, and complete adaptability to the purposes intended.

## 42. K. L. Speth, New York, N. Y., U. S.

FANCY CABINET WARE.

*Report.*—Commended for cheapness and fair workmanship.

## 43. John Griendling, Philadelphia, Pa., U. S.

BARBER CHAIR WITH FOOT-REST COMBINED.

*Report.*—Commended for convenient arrangement for adjusting it: a good chair for the price.

## 44. Theodore J. Palmer, New York, N. Y., U. S.

RECLINING AND ROCKING CHAIR.

*Report.*—Commended for originality in principle.

## 45. M. &amp; H. Schrenkeisen, New York, N. Y., U. S.

ROCKING CHAIR.

*Report.*—Commended for originality in principle.

## 46. Frank Rhoner &amp; Co., New York, N. Y., U. S.

ROCKING CHAIR.

*Report.*—Commended for originality in principle.



47. **Phelps, Doremus, & Corbett, New York, N. Y., U. S.**

PATENT CHAIR BASE, RUBBER SPRING FOR OSCILLATING CHAIR.

*Report.*—Commended for originality in patent, and compactness for transportation.48. **W. O. Taylor & Son, Bedford, Cuyahoga County, Ohio, U. S.**

DOUBLE CANE-SEAT CHAIRS AND ROCKERS.

*Report.*—Commended for durability and cheapness, and for compactness in knock-down double cane-seat chairs.49. **Julia Blanche French, Boston, Mass., U. S.**

BEDSTEAD WITH DRAWERS.

*Report.*—Commended for improvement in utilizing space underneath the bedstead, and for simplicity in construction, and economy in expense.50. **Ephraim Cutter, Cambridge, Mass., U. S.**

INVALID-CHAIR.

*Report.*—Commended for ease of adjustment to required positions.51. **Brown & Bliss, New York, N. Y., U. S.**

SUIT OF DINING-ROOM FURNITURE.

*Report.*—Commended for good quality of work combined with excellent style and finish, in a variety of patterns and sizes; prices reasonable, adapted to all classes.52. **Martin Kohler, Philadelphia, Pa., U. S.**

TAILOR'S CHAIR.

*Report.*—Commended for originality in construction, and for convenience and comfort.53. **Christine Olenson, Chicago, Ill., U. S.**

TABLE, ORGAN, AND BUREAU.

*Report.*—Commended for skill in design and practicability in construction. The articles being made under very disadvantageous circumstances, according to the statements in the return, render them eminently worthy of notice. The display of mechanical ingenuity by the exhibitor is entitled to great praise.54. **George Wilson, New York, N. Y., U. S.**

FOLDING BEDSTEAD AND RECUMBENT CHAIR.

*Report.*—Commended for simplicity in mechanism, and for usefulness.55. **Maires & Reed, New York, N. Y., U. S.**

ADJUSTABLE IRON CHAIR-FRAME.

*Report.*—Commended for simplicity in adjustment for changing the position of the occupant, rendering it a chair suitable for medical purposes as well as for comfort.56. **Adjustable Folding Chair Co., Pittsburg, Pa., U. S.**

ADJUSTABLE FOLDING CHAIRS.

*Report.*—Commended for simplicity of combination, practical utility, and neatness in appearance.

## 57. A. Kimble &amp; J. Cabus, New York, N. Y., U. S.

INTERIOR OF A ROOM, AND CEILING PAINTING.

*Report.*—Commended for originality of designs and execution; also for superior workmanship in cabinet work and upholstery.

## 58. Gottlieb Vollmer, Philadelphia, Pa., U. S.

CHAMBER FURNITURE.

*Report.*—Commended for perfection in design, combined with superior workmanship and finish in all respects; also for strictness in adherence to particulars in their respective styles.

## 59. Reeves &amp; Eastburn, Philadelphia, Pa., U. S.

ADJUSTABLE SLEEPING APARTMENT, SOFA BED.

*Report.*—Commended as an adjustable sleeping apartment which occupies a limited space when closed, and possesses the convenience of a bedroom when open; noticeable also for simplicity of adjustment.

## 60. E. W. Hutching &amp; Son, New York, N. Y., U. S.

OAK SIDEBOARD AND CHAIR IN GOTHIC STYLE.

*Report.*—Commended for good design and workmanship.

## 61. F. A. Gilbert, New Haven, Conn., U. S.

COMBINATION TABLE.

*Report.*—Commended for originality of design, by which the table is available and convenient for various purposes.

## 62. Ferdinand Lapp, Detroit, Mich., U. S.

WALNUT CLOCK CASE.

*Report.*—Commended for good design and excellent carving.

## 63. Alois Hummel, Baltimore, Md., U. S.

GOTHIC CLOCK CASE.

*Report.*—Commended for superior design and good workmanship.

## 64. Ferdinand Massett, Chicago, Ill., U. S.

CLOCK PEDESTAL.

*Report.*—Commended for artistic design and superior workmanship.

## 65. Mrs. Elizabeth Stiles, Philadelphia, Pa., U. S.

COMBINATION DESK.

*Report.*—Commended for its various combinations, whereby it is made useful for a great variety of purposes.

## 66. D. L. Ransom, Buffalo, N. Y., U. S.

ADJUSTABLE DESK AND BUSINESS CABINET.

*Report.*—Commended for its adaptability as an adjustable desk for the uses designed.

## 67. Wakefield Rattan Co., Boston, Mass., U. S.

## RATTAN FURNITURE.

*Report.*—Commended for original design and superior workmanship in furniture, chairs, and baskets, also for originality in the manufacture of mats and baskets of an otherwise waste material; also for new form of car seats, durable, cool, clean, and economical.

## 68. Z. Cobb &amp; Son, Wilmington, Del., and Chicago, Ill., U. S.

## CAR-SEAT AND BED SPRINGS.

*Report.*—Commended for lightness, cheap price, and adaptability to the purposes intended.

## 69. Edward W. Vaill, Worcester, Mass., U. S.

## FOLDING CHAIRS.

*Report.*—Commended for variety of style, strength, practicability, and beauty; also for comfort, convenience, portability, thoroughness of workmanship, and cheapness. The great number of patents applied deserve consideration.

## 70. Pottier &amp; Stymus Manufacturing Co., New York, N. Y., U. S.

## FURNITURE AND INTERIOR DECORATIONS.

*Report.*—An exhibit of furniture draperies, ceilings, hangings, and other articles, all of which are, in every respect, commended as examples of superior workmanship, being artistic in style, faithful in the details of mechanism, and ornate in general effect. The carvings are superb in design, and elaborately yet delicately wrought by experienced artists. The draperies, interior decorations, and paneling are fine specimens of decorative art. The whole exhibit shows structural correctness, skillful use of materials, happy blending of colors, and ornamentation of the highest order of art.

## 71. Laban Morse &amp; Sons, Athol, Mass., U. S.

## FOLDING SETTEE.

*Report.*—Commended for improved plan of folding settee; well made, comfortable, and cheap, and so constructed as to be easily folded into a compact form, occupying about one-sixth the space of an ordinary settee, thus obviating the necessity of removing seats from a hall or room when space is required for other purposes; very convenient for packing for shipping, etc.

## 72. Hale, Kilburn, &amp; Co., Philadelphia, Pa., U. S.

## HOUSE FURNITURE.

*Report.*—Commended for a champion folding bedstead, combining simplicity of construction with easy manipulation and handsome appearance; also for a child's crib, possessing the same merits; for a spring bed, which is flexible and springy in every part, noiseless and clean; for durable and comfortable wood seats for chairs and settees, which are easily attached to the frames; also for an easy spring rocking chair.

## 73. L. Marcotte &amp; Co., New York, N. Y., U. S.

## LOT OF FURNITURE.

*Report.*—A fine exhibit of furniture, including, as specially commended, a cabinet, style Henry II.; design artistic, and carving perfect in detail of execution and effect; also a mantel, an artistic interpretation of the style of Louis XIII. The entire exhibit is noticeable as displaying very remarkable success in reproducing the art characteristic of these two periods.

**74. Halm, Bellows, & Butler, Columbus, Ohio, U. S.**

## FURNITURE.

*Report.*—A fine exhibit of goods manufactured to meet the demands of their trade. Commended as the work of careful artisans, especially the interior details. The character of the woods gives evidence of great care in their selection.

**75. Kilian & Brother, New York, N. Y., U. S.**

## CARVED BRACKETS, BEDSTEADS, AND TABLES.

*Report.*—As extensive use of machinery is made in their manufacture, the goods are recommended for cheapness, being within reach of people of moderate means who have a taste for the ornamental.

**76. The Wooton Desk Co., Indianapolis, Ind., U. S.**

## CABINET OFFICE SECRETARY.

*Report.*—Commended for compactness, convenience, and utility.

**77. Palmer & Kendall, New York, N. Y., U. S.**

## MOSQUITO NET CANOPIES.

*Report.*—Commended for a production economical, portable, and strong; well constructed for the special uses designed.

**78. William B. Smith, New York, N. Y., U. S.**

## IMPROVED COUNTER SHOW-CASE.

*Report.*—Commended for good workmanship and adaptation to the purposes intended.

**79. Charles Buschor, Philadelphia, Pa., U. S.**

## SHOW-CASES.

*Report.*—Commended for superiority in design and workmanship, being well adapted for the purposes intended.

**80. A. Ledig & Son, Philadelphia, Pa., U. S.**

## OCTAGONAL SHOW-CASE.

*Report.*—Commended for design of case and for fine polish and whiteness of the nickel plating.

**81. C. Claes & Co., St. Louis, Mo., U. S.**

## SILVER-PLATED SHOW-CASE.

*Report.*—Commended for substantial workmanship, good taste, and finish.

**82. Lange & Brother, St. Louis, Mo., U. S.**

## SHOW-CASE.

*Report.*—Commended for good and elaborate workmanship.

**83. James Chase, Rochester, N. Y., U. S.**

## AQUARIUM AND PLANT AND FLOWER STAND.

*Report.*—Commended for combination of ornamentation and adaptability for uses intended.

84. **Freeman & Smith, Racine, Wis., U. S.**

## AQUARIUM AND FLOWER STANDS.

*Report.*—Commended for durability, lightness, and variety displayed.

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85. **Brunswick, Stephani, & Hart, Chicago, Ill., U. S.**

## BILLIARD TABLE.

*Report.*—Commended for superior workmanship and elegant finish.

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86. **Henry Pottin, Philadelphia, Pa., U. S.**

## PARLOR BILLIARD TABLE.

*Report.*—Commended for economizing space, and for originality of construction, whereby the table is made available for billiards, cards, chess, and dominoes.

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87. **L. Decker & Co., New York, N. Y., U. S.**

## BILLIARD TABLE.

*Report.*—Commended for originality of design in the construction of the cushion, viz., the corded edge, and the manner in which the table is put together.

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88. **H. W. Collender, New York, N. Y., U. S.**

## BILLIARD TABLE.

*Report.*—Commended for simplicity and solidity of construction, beauty of design and finish; also for durability, correctness, and elasticity of cushion.

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89. **J. M. Brunswick & Balke Co., Chicago, Ill., U. S.**

## BILLIARD TABLE.

*Report.*—Commended for beauty of design, superior workmanship in frame, and durability and elasticity of cushion.

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90. **Hart, Son, Peard, & Co., London, England.**

## FURNITURE.

*Report.*—Commended for superior work and for variety and excellence of design.

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91. **Leonard W. Collmann, London, England.**

## FURNITURE.

*Report.*—Commended for exquisite finish and workmanship, with mythological ornamentation of superb design and execution.

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92. **Peyton & Peyton, Birmingham, England.**

## BEDSTEADS.

*Report.*—Commended for beauty of style and finish in their manufacture, variety of patterns, prices, and sizes, for their adaptability to the different markets of the world, and for equal excellence both in the lower and higher grades of goods.

## 93. Howard &amp; Sons, London, England.

## FURNITURE.

*Report.*—Commended as a fine display in furniture, illustrating a new process of inlaying, by the pressure of veneer into solid wood; designs artistic and finish excellent; upholstered work and gilding superb.

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## 94. James Shoolbred &amp; Co., London, England.

## FURNITURE.

*Report.*—Furniture and appointments in different styles of six rooms, commended as massive in richness of material, artistic in details of carving, elegant in harmony of design and arrangement of color, luxurious as well as practical in appliances for comfort, and the workmanship the best.

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## 95. Collinson &amp; Lock, London, England.

## FURNITURE.

*Report.*—Commended for richness of style and material, elegance of design, and superior work; first-class in all respects.

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## 96. Bradley Barnard, London, England.

## FURNITURE.

*Report.*—Commended for practical utility, comfort, convenience, and safety; also for the beauty of its appointments, and for portability.

Invalid and camp tables are commended for originality and adaptability for practical uses.

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## 97. Cox &amp; Sons, London, England.

## FURNITURE.

*Report.*—Commended as being first-class in all respects, especially in harmony of design; also for adaptation of art furniture and accessories to the style of architecture in building, both for churches and domestic use.

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## 98. Cooper &amp; Holt, London, England.

## FURNITURE.

*Report.*—Commended as a first-class exhibit, artistic and decorative, as well as suitable for general domestic use; very superior work.

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## 99. Wm. Scott Morton &amp; Co., London, England.

## FURNITURE.

*Report.*—Commended for elegance in combination of materials and decorations, and for being artistic in design and in detail of execution.

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## 100. Wright &amp; Mansfield, London, England.

## FURNITURE.

*Report.*—A magnificent display of unique work, in the style of the eighteenth century, mahogany and inlaid. These fine specimens of material and workmanship commend themselves to special notice.

## 101. Wm. Lee, Toronto, Ontario, Canada.

## FURNITURE.

*Report.*—Commended for an inlaid table, well made, good finish, and perfect workmanship.

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## 102. Joseph Roy &amp; Co., Montreal, Canada.

## INVALID-CHAIR.

*Report.*—Commended for the facility with which it can be changed from a horizontal to an upright position, and for adaptability for the sick-room.

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## 103. Shootof, St. Petersburg, Russia.

## FURNITURE.

*Report.*—Commended as a well-constructed chair, of good workmanship and original in design.

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## 104. Charles Briggen, St. Petersburg, Russia.

## BILLIARD TABLE.

*Report.*—Commended for careful workmanship and handsome appointments.

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## 105. Leontief, St. Petersburg, Russia.

## FURNITURE.

*Report.*—Commended for an ornamental arm-chair, combining strength, durability, and beauty; for ornamented table and chairs produced at low prices.

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## 106. Shrader, St. Petersburg, Russia.

## FURNITURE.

*Report.*—Commended for a handsomely constructed carved arm-chair of good design and workmanship.

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## 107. Maurice Gruenwald, Riga, Russia.

## FURNITURE.

*Report.*—Commended for ingenuity displayed in arrangement and construction of chairs, settees, tables, and many other articles, from the horns of different animals.

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## 108. Adolphus Wunsch, St. Petersburg, Russia.

## OFFICE DESK AND CHAIR.

*Report.*—Commended for good design, workmanship, and superiority in taste and finish.

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## 109. Igoomnof, St. Petersburg, Russia.

## TWO ANTIQUE HALL CHAIRS.

*Report.*—Commended for good designs and fair workmanship.

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## 110. Gaspard de Camilly, St. Petersburg, Russia.

## FURNITURE.

*Report.*—Commended for good design and workmanship and well-finished carvings.

**111. Hoessrich & Woerffel, St. Petersburg, Russia.****FURNITURE IN MALACHITE AND OTHER HARD STONES.**

*Report.*—Commended as artistic and rich in design, ornate and effective in appearance, and excellent in finish.

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**112. Negishi Manzo, Tokio, Japan.****FURNITURE.**

*Report.*—Carved wood bedsteads, wardrobe, and cabinet; commended as very good in design, work, and finish. The coffer panels in the cabinet are very finely enameled, and the whole exhibit is highly meritorious.

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**113. Kikuchi-Kuhei, Tokio, Japan.****FURNITURE.**

*Report.*—Commended for a great variety of racks, chairs, picture-frames, and other articles, superior in workmanship and finish.

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**114. H. Fujisawa, Osaka, Japan.****FURNITURE.**

*Report.*—Commended for lacquered lunch-boxes and trays, bas-relief engravings, superior in finish and good taste.

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**115. M. Ota, Tokio, Japan.****FURNITURE.**

*Report.*—Commended for cabinets and other articles of good workmanship, adapted to answer the purposes of manufacture.

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**116. K. Iwahashi, Kuroimura, Kii, Province of Kii, Japan.****LACQUERED WARES.**

*Report.*—Commended for good, useful, and cheap articles, and perfect work.

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**117. G. Awoumi, Hiromai, Mutzu, Japan.****FURNITURE.**

*Report.*—Commended for small articles, lacquer of peculiar mixture to produce a checkered, marbled appearance; celebrated for durability and hardness.

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**118. Lacquered Ware Manufactory, Kiyoto, Japan.****FURNITURE.**

*Report.*—Commended for a variety of lacquered articles in black and gold; fine work, of good quality and low price.

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**119. Ch. Minoda, Tokio, Japan.****FURNITURE.**

*Report.*—Commended for a great variety of gold-lacquered articles of the finest finish, and producing a remarkably ornamental effect; also for well-finished work in ivory, with gold lacquer and floral ornamentation.



**120. First Japanese Manufacturing and Trading Co., Tokio, Japan.****FURNITURE.**

*Report.*—Commended for lacquered furniture of very superior work, fine design, and good finish; also for a most remarkable black lacquered tray, ornamented with water-plants executed in gold of different colors and shades, finely engraved, producing a marvelous effect. The same description applies to a cabinet.

**121. Y. Yamamoto, Shizuoka, Suruga, Japan.****FURNITURE.**

*Report.*—Commended for cabinets composed of different woods, inlaid; rich work and well finished; also for cabinets, boxes, etc., made of bamboo cane in combination with wood; all neat and beautiful articles.

**122. S. Uyemura, Tsuruga, Yechizen, Japan.****FURNITURE.**

*Report.*—Commended for lacquered ware, marbleized; also for a peculiar process of laying seals, needles, leaves of different plants and trees, on the surface before the lacquer is dry, and pressing, then rubbing down with stone, and varnishing; splendid in effect and well done.

**123. H. Nakamura, Kiyoto, Japan.****FURNITURE.**

*Report.*—Commended for lacquered boxes and trays, all well finished, and good work.

**124. S. Ishioka, Noshiro, Ugo, Japan.****FURNITURE.**

*Report.*—Commended for small boxes and cups, lacquered on the natural wood; good cheap articles and generally useful.

**125. T. Murakami, Kiyoto, Japan.****FURNITURE.**

*Report.*—Commended for good and well-finished lacquered work, in different shades of gold.

**126. Local Government of Toyo-oka-Ken, Japan.****FURNITURE.**

*Report.*—Superior straw work and boxes, book-cases and cabinets; all tasteful in design and composition, beautiful in appearance, and of first-rate workmanship.

**127. H. Arai, Tokio, Japan.****LACQUERED FURNITURE, TABLES, CHAIRS, AND SCREENS.**

*Report.*—Commended for a very fine quality of workmanship and richness of design, possessing true artistic merit.

**128. M. Marunaka, Kanazawa, Kaga, Japan.****FURNITURE.**

*Report.*—Commended for two flower-vases in wood, gold-lacquered, finely finished, and rich in ornamentation and effect.

## 129. Ho A Ching, Canton, China.

## FURNITURE.

*Report.*—Commended for beauty of design, superior workmanship and finish.

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## 130. Sung Sing Kung, Ningpo, China.

## FURNITURE.

*Report.*—A very generous display; carving excellent and very rich.

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## 131. Yut Shing, Canton, China.

## FURNITURE.

*Report.*—Commended for a very good exhibit of tables and screens, lacquered; good taste, and perfect design.

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## 132. Fow Loong, Canton, China.

## FURNITURE.

*Report.*—Chairs and sofas, very good in manufacture, and excellent in carving.

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## 133. Lee Ching, Canton, China.

## FURNITURE.

*Report.*—Commended for very good workmanship and finish and very tasteful design.

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## 134. Mazaroz-Riballier, Paris, France.

## FURNITURE.

*Report.*—Commended for artistic design, superior workmanship and execution. These fine specimens of material and workmanship commend themselves to special notice.

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## 135. Lichtenfelder, Paris, France.

## IRON CHAIRS.

*Report.*—Commended for the great variety displayed in the use of iron for spring-seat chairs, very well made, useful, adapted to the purpose intended, and cheap.

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## 136. J. F. Van Ginderdeuren, Brussels, Belgium.

## FURNITURE.

*Report.*—Commended for good design and workmanship in furniture and carved oak, and exceedingly cheap prices.

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## 137. Henry Zech, Malines, Belgium.

## FURNITURE.

*Report.*—Exhibits a small walnut cabinet for jewelry, noticeable for its good design, superior workmanship, excellent carving, and moderate price.

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## 138. C. B. Hansen, Copenhagen, Denmark.

## FURNITURE.

*Report.*—Commended for a drawing-room suit, of good design, superior workmanship, and very tasteful.

**139. G. Sanchez, Maracaibo, Venezuela.**

SPECIMEN OF CABINET WARE.

*Report.*—Commended for first-class workmanship.**140. Forsano Brothers, Madrid, Spain.**

FURNITURE.

*Report.*—Commended for a very fine sideboard, well carved, of good design and workmanship.**141. Desiderio Rodriguez, Cienfuegos, Cuba.**

INLAID ROUND TABLE.

*Report.*—Commended for artistic design; superior workmanship, showing great ingenuity and skill, there being one hundred thousand different pieces in the top.**142. Augusto Prudencio Santos Chaves, Lisbon, Portugal.**

IRON FURNITURE.

*Report.*—Commended for originality of design, superior workmanship, and adaptability to the purposes intended.**143. Francisco Garcia, Oaxaca City, Mexico.**

BENT-WOOD FURNITURE.

*Report.*—Commended for good design, workmanship, and adaptability for purposes intended.**144. Joseph Parvis, Cairo, Egypt.**

FURNITURE.

*Report.*—Commended for beautiful exhibit of furniture; carved and mosaic designs: artistic and of good workmanship.**145. Haim Vidal, Constantinople, Turkey.**

EMBROIDERED MATERIALS FOR FURNITURE.

*Report.*—Commended for splendid display of embroidered goods for furniture, excellent both in material and design.**146. House of Correction of Bahia, Brazil.**

FURNITURE.

*Report.*—Commended for a writing-desk. It is substantially made of well-selected materials, and shows good workmanship.**147. House of Correction of Rio de Janeiro, Brazil.**

FURNITURE.

*Report.*—Commended for a cabinet and suit of furniture which shows fair workmanship in construction. The seats are comfortable and prices low.**148. F. J. Moreira & Co., Rio de Janeiro, Brazil.**

FURNITURE.

*Report.*—Commended for an exhibit of cane-seat chairs, arm-chairs, settees, and two cabinets; all of which are meritorious for excellent designs, good work, and finish.

**149. Salvatore Coco, Palermo, Italy.**

## FURNITURE.

*Report.*—Commended for a cabinet, with ornamentation in ivory and bronze statues; design artistic, and workmanship fine.

**150. Pasquale Carrara, Bergamo, Italy.**

## FURNITURE.

*Report.*—Commended for three cabinets, and frames in carved wood, style Italian Renaissance; displaying superior excellence in design and carving, and skill in workmanship.

**151. Antonio Catalano, Palermo, Italy.**

## FURNITURE.

*Report.*—Commended for lacquered tables, with pearl incrustations; meritorious for good workmanship and artistic design and finish.

**152. S. & G. Cavallaro, Palermo, Italy.**

## FURNITURE.

*Report.*—Commended for a bronze bedstead of good workmanship and design.

**153. Ferdinando Pogliani, Milan, Italy.**

## TABLES INLAID WITH IVORY.

*Report.*—Commended for artistic designs, beautiful engraving, and superior workmanship.

**154. A. B. Tenner, Eisfeld, Germany.**

## FURNITURE.

*Report.*—Designs good; articles very useful; prices low.

**155. Otto Völker, Berlin, Germany.**

## FURNITURE.

*Report.*—These articles are well designed and the carvings particularly well executed.

**156. O. B. Friedrich, Dresden, Germany.**

## FURNITURE.

*Report.*—The quality of these articles is superior. The cabinet, in Italian Renaissance style, is especially artistic, and the workmanship praiseworthy in every respect.

**157. Georg Schöttle, Stuttgart, Germany.**

## OAK SIDEBOARD.

*Report.*—The carved oak sideboard is a fine piece of work, artistic in style and proportion, well adapted for the purpose intended, and at reasonable price.

**158. Ferd. Vogts & Co., Berlin, Germany.**

## CABINET AND DRESSING CASE.

*Report.*—Commended for utility, superior workmanship, and correct designs.

## 159. J. Neuhusen, Berlin, Germany.

## BILLIARD TABLE.

*Report.*—Commended for beautiful and original design. The workmanship is of very superior quality, and the cues with their frames are equally commendable.

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## 160. Carl Stein, Vienna, Austria.

## CABINET FURNITURE.

*Report.*—Commended for artistic design, good workmanship, and adaptation for the purposes intended.

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## 161. I. Dillmann &amp; L. Fischer, Vienna, Austria.

## IRON FURNITURE.

*Report.*—Commended for a great variety of iron bedsteads, which are moderate in cost, of good workmanship, and adapted to the purpose intended, being very light and durable.

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## 162. Jacob &amp; Joseph Kohn, Wsetin, Moravia, Austria.

## FURNITURE OF BENT WOOD.

*Report.*—A large variety of bent-wood furniture. The exhibit comprises chairs, tables, flower stands, and railings. This work is commended for its utility, strength, beauty, and comfort. Its style is varied, finish excellent, and expense reasonable.

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## 163. Rudolf Rigl, Döbling, near Vienna, Austria.

## IRON DOUBLE BED.

*Report.*—Commended for an iron sofa frame upholstered so as to make a comfortable sofa. It is also capable of such changes as to furnish two bedsteads with two good beds. A novel and original design.

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## 164. L. J. Nooijen, Rotterdam, Netherlands.

## FURNITURE.

*Report.*—Commended for fine exhibit of fire-screens and fancy goods lacquered, in good taste, and of fine workmanship.

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## 165. G. Van der Lugt, The Hague, Netherlands.

## FURNITURE.

*Report.*—Commended for a fine display of fire-screens and lacquered fancy goods, well made and very ornamental in design and finish.

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## 166. Marion Blind Co. (Linden Park, Agent), Brady, Indiana County, Pa., U. S.

## INSIDE SLAT WINDOW-BLINDS.

*Report.*—Commended for simplicity and cheapness.

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## 167. Meriden Curtain Fixture Co., Meriden, Conn., U. S.

## CURTAIN FIXTURE.

*Report.*—Commended for simplicity and for facility of adjustment.

**168. F. C. D. McKay, Paterson, N. J., U. S.**

## SHADE ROLLERS.

*Report.*—Commended for good and simple construction, and ease of adjustment, at reasonable price.

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**169. Charles W. Clark, Philadelphia, Pa., U. S.**

## WINDOW SHADES AND WINDOW-SHADE CLOTH.

*Report.*—Commended for superior design, tone of colors, and general finish of the shade cloth and window shades.

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**170. Bradford & Co., Philadelphia, Pa., U. S.**

## SASH FASTENER.

*Report.*—Commended for a very useful sash fastener, practical and simple.

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**171. Edwin Louderback, Philadelphia, Pa., U. S.**

## IMPROVED RUSTIC WINDOW SHADES.

*Report.*—Commended for shades well adapted to secure light and ventilation.

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**172. F. E. Colwell & Co., Chicago, Ill., U. S.**

## SHADE FIXTURES.

*Report.*—Commended for simplicity and cheapness.

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**173. Edwin S. Johnston, Philadelphia, Pa., U. S.**

## WINDOW-SHADE ROLLER.

*Report.*—Specially commended for improved window-shade roller, combining simplicity and durability.

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**174. American Shade Roller Co., Boston, Mass., U. S.**

## SHADE ROLLERS AND WINDOW SHADES.

*Report.*—Commended for a simple and useful fixture as exhibited in the spring balance, store, and Eastern shade rollers, combining durability and cheapness.

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**175. Stewart Hartshorn, New York, N. Y., U. S.**

## AUTOMATIC CURTAIN ROLLER.

*Report.*—Commended for strong and durable shade roller, which by long use has proved itself valuable.

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**176. William Campbell, New York, N. Y., U. S.**

## SPRING ROLLERS FOR WINDOW SHADES.

*Report.*—Commended for simplicity, durability, and reasonable price.

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**177. J. C. Anderson, Pittsburg, Pa., U. S.**

## SASH BALANCE.

*Report.*—Commended for good design, durability, combined with simplicity.

**178. Alfred S. Dickinson, New York, N. Y., U. S.**

DROP AND REVERSIBLE SPRING ROLLER WINDOW SHADE.

*Report.*—Commended for an improved and useful shade roller.**179. James G. Wilson, Washington Heights, New York, N. Y., U. S.**

VENETIAN BLINDS AND SHUTTERS.

*Report.*—Commended for good work, durability, and utility.**180. Salem Shade Roller Manufacturing Co., Salem, Mass., U. S.**

BALANCE SPRING SHADE ROLLER.

*Report.*—Commended for spring balance roller, with automatic arrangements so improved as to produce a strong, durable fixture; also for a stop shade roller, combining simplicity and utility.**181. Lloyd Brothers, Philadelphia, Pa., U. S.**

VENTILATING WINDOW-SHADE FIXTURE.

*Report.*—Commended for a useful invention, combining neatness in construction with convenience and comfort.**182. Edwin W. Brady, Davenport, Iowa, U. S.**

WINDOW SHADES.

*Report.*—Commended for durability, owing to the method of construction, being made of slats and woven double, thus securing both shade and ventilation.**183. Reuben Swedenborg Whittier, Hyde Park, Mass., U. S.**

WINDOW SCREEN AND MOSQUITO BAR.

*Report.*—Commended for a simple, light, cheap, and convenient window screen on rollers.**184. Robert Ellis & Co., New York, N. Y., U. S.**

FURNITURE AND FONT.

*Report.*—Commended for originality of composition and boldness of treatment, especially in the carved work, both in design and manipulation.**185. F. & H. Schroeder, Cincinnati, Ohio, U. S.**

GOTHIC CARVED OAK PULPIT.

*Report.*—Commended for style of architecture, representing in ornamental carving the institution and design of the pulpit. The effect is ornate and artistic, and the workmanship good.**186. John S. Paine, Boston, Mass., U. S.**

PULPITS, CHAIRS, FONTS, AND COMMUNION TABLES.

*Report.*—Commended for adaptability to uses intended, at very moderate prices.**187. T. W. Singer & Son, Frome, Somerset, England.**

CHURCH ORNAMENTS.

*Report.*—Commended for work eminently praiseworthy as original and well done.

**188. L. Chovet, Paris, France.**

## CHURCH ORNAMENTATION.

*Report.*—Commended for paintings and ornaments of good designs, well finished, and in great variety.

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**189. Froc-Robert & Son, Paris, France.**

## CHURCH ORNAMENTATION.

*Report.*—Commended for a very tasteful selection of religious statues and two altars, perfect in style and workmanship, for chasteness of outline, beauty of design, and excellence in all other details of ornamentation.

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**190. Mayaud Brothers, Paris, France.**

## CHURCH FURNITURE.

*Report.*—Commended for the great quantity of religious objects displayed; also for the variety, design, and execution, combined with cheapness.

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**191. Beysens & Beckers, Paris, France.**

## CHURCH FURNITURE.

*Report.*—Commended for a great variety of articles for use in church service; all well made; designs good and prices low.

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**192. Paul Brunet, Paris, France.**

## CHURCH ORNAMENTS.

*Report.*—Commended for cheapness, combined with fair workmanship and good taste.

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**193. Louis Michel, Toulouse, France.**

## CHURCH ROBES AND VESTMENTS.

*Report.*—Commended for elegance of design, good material and workmanship, and cheapness.

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**194. Raffi & Co., Paris, France.**

## CHURCH FURNITURE.

*Report.*—Commended for a very generous display of statuary for church purposes; well made, design fair, and coloring and expression good.

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**195. L. Jolivet, Paris, France.**

## WAX CANDLES.

*Report.*—Commended for a great variety of wax and composition candles, made well, of good material.

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**196. Goyers Brothers, Louvain, Belgium.**

## CHURCH FURNITURE.

*Report.*—Commended for their exhibit of an ogival pulpit. It shows excellent design; superior workmanship, both in carving and finish. It is in all respects first-class.



**197. Mayer's Art Institution, Munich, Germany.****CHURCH FURNITURE.**

*Report.*—The altar in gothic style is a fine specimen of architecture and workmanship. The collection of religious ornaments is extensive, and the whole exhibition is entirely commendable.

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**198. Paul Rath, New York, N. Y., U. S.****DRAWING-ROOM DECORATIONS.**

*Report.*—Commended for a beautiful display of curtain draperies, very artistic in design, and of exquisite workmanship; also for screen and pedestal, possessing true merit in style and effect.

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**199. Walker Glass Importing, Silvering and Manufacturing Co., New York, N. Y., U. S.****GLASS INTERIOR DECORATIONS.**

*Report.*—Commended for originality, good workmanship, and new application of glass for interior decorations.

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**200. James W. Cooper & Brother, Philadelphia, Pa., U. S.****BRACKETS, WALL-POCKETS, MUSIC PORTFOLIOS, AND CABINETS.**

*Report.*—Commended for a fine display of goods adapted to the wants of people of moderate means. The workmanship is good and designs neat.

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**201. Pape Brothers & Kügeman, Cincinnati, Ohio, U. S.****MOULDINGS OF GILT AND WALNUT, AND OTHER ARTICLES.**

*Report.*—Commended for a good quality of work, and fine imitation.

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**202. George C. Reukauff, Philadelphia, Pa., U. S.****MANTEL-PIECE AND MIRRORS AND PICTURE FRAMES.**

*Report.*—Commended for superior design and workmanship in picture frames.

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**203. Miss Mary Story, Cambridge, Mass., U. S.****ETCHING WITH PEN AND INK.**

*Report.*—Commended for perfection in transferring designs with pen and ink on chess-table.

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**204. John G. Salter, Philadelphia, Pa., U. S.****MANTEL MIRROR, AND BOUQUET TABLE.**

*Report.*—Commended for good work and designs in manufacture and gilding.

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**205. A. C. Lowe, Philadelphia, Pa., U. S.****LOOKING-GLASSES, AND BOUQUET TABLES, ETC.**

*Report.*—Commended for fair designs and very good work; gilding well done.

## 206. Kaiser &amp; Herzog, Philadelphia, Pa., U. S.

## PARLOR DECORATION.

*Report.*—Commended for original designs, perfection in style, and correctness of execution and detail.

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## 207. Mrs. Mary I. James, Cambridge, Mass., U. S.

## ETCHING ON CHESS-TABLE WITH PEN AND INK.

*Report.*—Commended for original designs and perfection of illustration with pen and ink on chess-table.

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## 208. Carrington, De Zouche, &amp; Co., Philadelphia, Pa., U. S.

## INTERIOR DECORATIONS.

*Report.*—Commended for fine specimens of elegant upholstery work in design and execution.

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## 209. J. E. McClees &amp; Son, Philadelphia, Pa., U. S.

## MANTEL MIRRORS.

*Report.*—Commended for originality and novelty in design and excellence in workmanship.

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## 210. George C. Newman, Philadelphia, Pa., U. S.

## LACQUERED MOULDING FOR PICTURE FRAMES.

*Report.*—Commended for perfection in imitation, and cheapness.

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## 211. Felix Reifschneider, New York, N. Y., U. S.

## VELVET FRAMES, AND VELVET AND MOROCCO CASES.

*Report.*—Commended for original, varied, and choice designs in velvet frames, and other articles; fine specimens of work, showing good taste and careful finish.

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## 212. Lewis Pattberg &amp; Brothers, New York, N. Y., U. S.

## PICTURE FRAMES.

*Report.*—Commended for superior workmanship and elegance of finish.

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## 213. James S. Earle &amp; Son, Philadelphia, Pa., U. S.

## MIRROR FRAMES, AND WINDOW CORNICE.

*Report.*—Commended for originality of design, combined with elegance, utility, and excellence of workmanship.

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## 214. Eckhardt &amp; Mehler, Baltimore, Md., U. S.

## GILT FRAMES.

*Report.*—Commended for good workmanship.

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## 215. Sherk &amp; Brother, Brooklyn, N. Y., U. S.

## PICTURE FRAMES.

*Report.*—Commended for good workmanship and effective design; also for carving and finish.

**216. C. Faser, Philadelphia, Pa., U. S.**

GILT TABLES, AND MIRROR AND PICTURE FRAMES.

*Report.*—Commended for good designs, good work, and fair finish.**217. Lucien Dubernet, New York, N. Y., U. S.**

PICTURE FRAMES IN VELVET AND METAL.

*Report.*—Commended for a fine assortment, containing many beautiful designs, the workmanship in metal frames being of superior quality.**218. Frederick Boland, Philadelphia, Pa., U. S.**

LOOKING-GLASS AND PICTURE FRAMES, AND BOUQUET TABLE.

*Report.*—Commended for good work, fair designs, and reasonable price.**219. Samuel James, Philadelphia, Pa., U. S.**

ROTARY COLOR STAND FOR ARTISTS' USE.

*Report.*—It is ornamental, convenient, and adapted to the purposes intended.**220. School of Design of the University of Cincinnati, Ohio, U. S.**

ORNAMENTAL CARVING.

*Report.*—Commended as remarkable specimens of carving by the women of Cincinnati School of Design, evincing refined and artistic taste in design, and skill in execution. Of the many works of rare excellence, a representative sample is shown in the bedstead carved by the Misses Johnson, an example of patient perseverance in labor, fine adaptation in the selection, skillful carving in the nicer details, and eminent success in producing an effect both ornate and artistic.

The other carving in this exhibit is meritorious in the same respect as the bedstead.

**221. Adolph Thiery, Philadelphia, Pa., U. S.**

MANTEL AND PIER MIRRORS, AND CHAIRS.

*Report.*—Commended for fair designs, construction, and gilding.**222. Charles R. Yandell & Co., New York, N. Y., U. S.**

LEATHER LAMBREQUINS.

*Report.*—Commended for excellence of work and elegance of design and finish, the embossed work being very artistic and beautiful.**223. A. C. Engert & Co., London, England.**

GILT MOULDINGS.

*Report.*—Commended for good taste, design, and workmanship, and for low price.**224. Doulton & Watt, London, England.**

MANTEL-PIECE.

*Report.*—Commended for fair success in the introduction of faience as an art decoration in the manufacture of furniture.

**225. Harry Hems, Exeter, England.**

ALABASTER STATUE AND OAKEN CHEST.

*Report.*—Commended for eminent success in reproducing an antique type of architecture in the chest; for the fidelity and solidity of the work; for chasteness of outline, beauty of carvings, and completeness of design; also for the perfection and purity of material and carefulness of finish in the sculptured figure, and excellence in all other details of ornamentation.

**226. Q. W. Tuerk, Berlin, Ontario, Canada.**

CLOCK CASE AND CHANDELIERS IN OAK.

*Report.*—Commended for an ornamental design, well carved.

**227. Louis Muschialli, Melbourne, Victoria, Australia.**

PIER GLASS AND CONSOLE TABLE.

*Report.*—Commended for originality of design and good workmanship.

**228. Leopold Brothers, Paris, France.**

TRIPARTITE LOOKING-GLASSES.

*Report.*—Commended for fine work, ornamental style, and adaptation to the uses of the dressing-room.

**229. Jules Houry, Paris, France.**

FAÏENCE.

*Report.*—Commended as a fine selection of faïence, and for a correct rendering of the styles in their application to furniture.

**230. F. Massham, Kiel, Germany.**

GOLD CORNICES.

*Report.*—The mouldings are finished in a superior manner; many of the designs are beautiful, and the price is very low for the quality of the work.

**231. W. Voeltzkow, Berlin, Germany.**

MIRRORS AND PICTURE FRAMES.

*Report.*—The variety of styles, their cheapness and general usefulness, render them meritorious.

**232. G. W. Voeltzkow, Jr., Berlin, Germany.**

METAL FRAMES.

*Report.*—These frames are very useful and inexpensive, their cheapness being their merit.

**233. Homer J. Beaudet, Green Point, Long Island, N. Y., U. S.**

CONVERTIBLE SWING CRADLE.

*Report.*—Commended for superior execution as displayed in cabinet work.

**234. Philip Klag, New York, N. Y., U. S.**

WILLOW WORK.

*Report.*—Commended for ingenuity in construction and arrangement.

**235. Edward Jansen, New York, N. Y., U. S.**

STRAW, WILLOW, AND CANES.

*Report.*—Commended as a fine exhibit of fancy baskets in graceful designs; also meritorious for good workmanship and originality.

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**236. Eloise B. Walcott, Boston, Mass., U. S.**

BASKET WARE MADE FROM STRAW.

*Report.*—Commended for good workmanship, and taste displayed in the arrangement.

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**237. Charles Zinn & Co., New York, N. Y., U. S.**

BASKETS AND WILLOW-WARE.

*Report.*—Commended for superior workmanship and elegance of style. A fine specimen of American manufacture.

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**238. John W. Boughton, Philadelphia, Pa., U. S.**

PARQUETRY FLOORING.

*Report.*—Commended for good designs and work, low prices, and durability: the woods being attached to cloth, water-proof, are easily laid in any room.

Mosquito and fly screen for windows, commended as useful, easily adjusted, and cheap.

"Nursery safety-gate" commended as eminently useful for the protection of children from danger; thoroughly made and easily adjusted.

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**239. Alfred H. Andrews & Co., Chicago, Ill., U. S.**

INLAID MARQUETRY FLOORING.

*Report.*—Commended for thorough workmanship in dovetail marquetry flooring, making it strong and durable.

A strong and portable book-rest; a very good article for the purpose intended.

A cylinder office desk of good workmanship and practically designed.

Church furniture commended for novelty in designs and good workmanship at reasonable prices.

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**240. J. Wright, Montreal, Canada.**

PARQUETRY FLOORING.

*Report.*—Commended for good taste, design, and workmanship, at low price, and very fine display.

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**241. Charles Hofe, St. Petersburg, Russia.**

WOOD AND MARBLE IMITATIONS.

*Report.*—Commended for a large variety of superior imitations (in all kinds of woods) of marble, stone, cane, and basket work, embracing a great variety of colors, and for excellent finish,

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**242. Tasson & Washer, Brussels, Belgium.**

PARQUETRY FLOORING.

*Report.*—Commended for specimens of parquetry and inlaid work for flooring. They show fine taste and workmanship and excellent finish.

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243. E. Krins, Spa, Belgium.

## WOOD BOXES.

*Report.*—Commended as a fine display in fancy goods painted on wood. They are neat in design, excellent in finish, both in carving and painting.

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## 244. J. B. Dogny, Brussels, Belgium.

## TURNED WOOD.

*Report.*—Commended for balusters made with lathes, very superior in finish, which shows the excellence of the machinery employed. They are of good workmanship and low in prices.

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## 245. Alexandre Debrus-Willem, Spa, Belgium.

## WOODEN BOXES.

*Report.*—Commended for fancy goods and painting on wood. This exhibit shows remarkable finish and elegance in carving and very neat and tasteful painting.

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## 246. Mathieu Brodure, Spa, Belgium.

## WOOD CARVINGS.

*Report.*—Commended for a display in fancy goods carved and painted. They deserve great praise for their elegant and delicate carving and the neat manner in which they are finished.

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## 247. Bronfort Brothers, Spa, Belgium.

## WOODEN WORK.

*Report.*—Commended for fancy goods and painting on wood. They are neat in design, well carved and very elegant in painting.

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## 248. Widow Debrus-Leclair, Spa, Belgium.

## WOODEN BOXES.

*Report.*—Commended for artistic taste and finish in fancy articles; carving delicate and neat; wood painting fine, and moderate prices.

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## 249. Pedro Villalobo, Morelia, Mexico.

## WILLOW WORK.

*Report.*—Commended for originality of design and good workmanship.

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## 250. Vester, Jerusalem, Syria, Turkey.

## FANCY GOODS IN WOODEN WARE.

*Report.*—Commended as a fine display of fancy goods in olive wood in a great variety of forms; work and finish superior.

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## 251. Cesare Marchini, Florence, Italy.

## STRAW WORK.

*Report.*—Commended for straw work and baskets; tasteful, well made, and in a great variety.

**252. Josef Hofrichter's Son, Reichenau, Austria.****PAPIER-MACHÉ BOXES.**

*Report.*—Commended for beautiful execution in the painting, and for workmanship.

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**253. Adolph Vogel, Innsbruck, Austria.****RELIGIOUS STATUES IN PAPIER-MACHÉ.**

*Report.*—Commended for good designs and fine execution, and for having brought to great perfection this art in his country.

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**254. Csank & Co., Vienna, Austria.****BASKET WORK.**

*Report.*—Commended for a good exhibit of basket work, sunshades, parasols, and fans in straw. It is good work, tasty, nicely finished, and cheap.

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**255. Anton Schöffel, Reichenau, Austria.****PAPIER-MACHÉ.**

*Report.*—Commended for good designs and finish and cheap prices.

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**256. L. F. Wahlström, Stockholm, Sweden.****WILLOW WORK.**

*Report.*—Commended for seats and flower stands in willow work, which are light, well finished, strong, and comfortable, and well adapted to the purposes intended.

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**257. Baeder, Adamson, & Co., Philadelphia, Pa., U. S.****CURLED HAIR.**

*Report.*—Commended for cheapness, general adaptability for purposes intended, careful and successful preparation for upholstering purposes.

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**258. Mellen & Co., New York, N. Y., U. S.****LIVE GEESE FEATHERS.**

*Report.*—Commended for superior quality, being thoroughly cleansed, free from all impurities, and the down retaining all its original softness and fullness. The process of steam cleansing and drying appears to remove all the pith from the stem of the feather, and is worthy of high commendation.

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**259. Mellen & Co., New York, N. Y., U. S.****CURLED HAIR.**

*Report.*—Commended as a superior quality of curled hair, very clean, hard, and elastic. Also, excellence of manufacture, and producing a uniform size of rope.

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**260. Herzog & Co., San Francisco, Cal., U. S.****IMITATION OF HORSE-HAIR.**

*Report.*—Commended as a good imitation of horse-hair, which is hard and clean.

**261. Phillips & Leyle, Jacksonville, Fla., U. S.**

BLACK MOSS.

*Report.*—Commended as of good quality, well cleaned, cheap, and well adapted for upholstering purposes.

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**262. The Delta Moss Co., New Orleans, La., U. S.**

MOSS.

*Report.*—Commended as a fine exhibit of a superior quality of moss.

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**263. The Woven Wire Mattress Co., Hartford, Conn., U. S.**

WOVEN WIRE MATTRESS.

*Report.*—Commended for elasticity, comfort, and cleanliness, being especially adapted to hospitals and asylums.

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**264. National Wire Mattress Co., New Britain, Conn., U. S.**

WIRE MATTRESS.

*Report.*—Commended for strength and portability, combined with cheapness and comfort.

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**265. Samuel P. Kittle, New York, N. Y., U. S.**

SPIRAL SPRING MATTRESSES.

*Report.*—Commended for elasticity, comfort, and durability; also for the variety in construction, and adaptation in prices to the wants of purchasers.

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**266. James V. Schenck, New York, N. Y., U. S.**

CRESCENT SPRING MATTRESS.

*Report.*—Commended for durability and permanent security of the middle of the springs; also for the elasticity and comfort of the mattress.

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**267. H. Delmotte, Ghent, Belgium.**

HOG BRISTLES.

*Report.*—Commended for good quality, cleanliness, and fitness for purpose intended.

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**268. Heinrich Stein & Co., Frankfort-on-the-Main, Germany.**

CURLED HAIR.

*Report.*—Commended for very fine quality, and thoroughly cleansed.

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**269. M. A. Caldwell, North East, Erie County, Pa., U. S.**

WASHING MACHINE AND WRINGER COMBINED.

*Report.*—Commended for originality in design, thoroughness with which the washing is done, and the low price of the machine.

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**270. Standard Laundry Manufacturing Co., Boston, Mass., U. S.**

## WASHING MACHINES.

*Report.*—The mangle commended for utility and adaptation to the uses of manufacture. The washing machine, cleaning the linen without rubbing, commended as well adapted for extensive use, simple in construction and in principle, and calculated to meet the public want.

The wringer commended as very meritorious in construction and adaptability.

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**271. Bailey Wringing Machine Co., New York, N. Y., U. S.**

## WRINGING MACHINE.

*Report.*—Commended for the construction of wringers which can be changed for use to either side of the tub, letting the water out either to right or left; also for a folding bench, so constructed as to support a wash-tub and wringer, and to be folded into a very small space when not in use.

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**272. A. W. Jennings, Bedford, Cuyahoga County, Ohio, U. S.**

## WASHING MACHINE.

*Report.*—Commended as useful and practical, well adapted for the purpose intended.

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**273. Robert O. Applegate, Camden, N. J., U. S.**

## IRONING TABLE.

*Report.*—Commended as a good adjustable ironing table, well adapted for family uses.

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**274. Asa E. Worden, Smyrna, Del., U. S.**

## WASHING MACHINE.

*Report.*—Commended for simplicity in construction, durability, and adaptability for family use.

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**275. N. A. Briggs, Shaker Village, Merrimac County, N. H., U. S.**

## WASHING MACHINES.

*Report.*—Commended for strength, size, simplicity, and capability for extensive uses.

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**276. H. O. Cheney, Hopkinton, Mass., U. S.**

## WASHING MACHINE.

*Report.*—Commended as a machine and wringer combined, well constructed, and well adapted for the uses of large families.

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**277. Isaiah D. Buck, Philadelphia, Pa., U. S.**

## WASHING MACHINE.

*Report.*—Commended as simple and cheap, well constructed to clean the linen without tearing it.

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**278. J. C. Gove & Sons, Cleveland, Ohio, U. S.**

## WASHING MACHINE.

*Report.*—Commended as very good in principle, cheap, and recommendable for family uses.

**279. York Manufacturing Co., York, Pa., U. S.****WASHING MACHINE.**

*Report.*—Commended as a good washing machine, effective, and well combined for the purpose intended; also a wringer, as very simple and cheap.

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**280. Oakley & Keating, New York, N. Y., U. S.****WASHING MACHINE.**

*Report.*—Commended as a powerful washing machine, very well constructed, simple, and well adapted for extensive uses, and performing the work very quickly.

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**281. J. S. Lash & Co., Philadelphia, Pa., U. S.****WASHING MACHINE.**

*Report.*—Commended as simple, original, and useful.

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**282. Calkins Champion Washer Co., Chicago, Ill., U. S.****WASHING MACHINE.**

*Report.*—Commended as a very good, useful, and practical washing machine, well adapted for family uses, and one of the best of those made on the same principle.

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**283. Colby Wringer Co., Waterbury, Vt., U. S.****CLOTHES WRINGER.**

*Report.*—Commended as substantially made, very durable, light to handle, easily attached and removed from the tub, and well adapted for the purpose intended.

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**284. James K. Dugdale, Whitewater, Ind., U. S.****CLOTHES WRINGER.**

*Report.*—Commended as perfectly self-regulating, and well fitted for the purpose intended.

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**285. A. B. Barnard, Worcester, Mass., U. S.****CLOTHES MANGLES.**

*Report.*—Commended as very good mangles, simple in construction, very effective, and well combined to be used as a hot or cold mangle.

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**286. James W. Pratt, Philadelphia, Pa., U. S.****WASHING MACHINE.**

*Report.*—Commended for a washing machine, combined with a wringer, well adapted for the purpose intended, and constructed on a very good principle.

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**287. Thomas E. McDonald, New Brunswick, N. J., U. S.****CLOTHES WRINGER.**

*Report.*—Commended as very useful and practical, well adapted for family uses and the purpose intended.

**288. Leopold Sternberger, Philadelphia, Pa., U. S.****IRONING AND STARCHING MACHINE.**

*Report.*—Commended for thoroughness of construction and adaptability to the purposes intended.

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**289. Francis H. Good, Philadelphia, Pa., U. S.****STEAM-BOILER FOR WASHING CLOTHING, ETC.**

*Report.*—Commended for the thoroughness with which the washing is done, great amount of labor saved, and the very reasonable price at which the machine is sold. The cleansing being done by steam, it avoids all friction, thereby saving any extra wear and tear of the articles washed. It can be used on any stove or range.

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**290. American Machine Co., Philadelphia, Pa., U. S.****WRINGING MACHINE AND FLUTING MACHINE.**

*Report.*—The wringer is commended for simplicity of construction and effectiveness of execution.

The fluting machine is commended for adaptability to purposes intended.

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**291. Henrietta H. Coles, Washington, D. C., U. S.****FLUTING MACHINE.**

*Report.*—Commended for originality in construction in the lever pressure, so that the lightest texture of fabric can be fluted without injury.

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**292. Lowerre & Tucker, Newark, N. J., U. S.****FLUTING MACHINE.**

*Report.*—Commended for beauty of design and finish; also for adaptation for the purposes intended.

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**293. Newton Wilson & Co., London, England.****WASHING MACHINE.**

*Report.*—Commended for a washing machine constructed upon a good principle which is well adapted to answer the purposes intended; also for a wringer constructed upon the best principles.

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**294. Ernest J. Knowlton, Ann Arbor, Mich., U. S.****BATH TUB.**

*Report.*—Commended as a portable and useful bathing apparatus, a very desirable and important article for general use.

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**295. Blakemore & Sherman, Philadelphia, Pa., U. S.****WASHSTAND.**

*Report.*—Commended for an original folding washstand, very practical and useful.

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**296. Draper & Sons, Melbourne, Victoria, Australia.****EARTH CLOSETS.**

*Report.*—Commended for ingenuity and simplicity of design, combined with utility and durability.

**297. Schuyler & Armstrong, Philadelphia, Pa., U. S.****BURIAL CASKETS AND ROBES, ALSO CORPSE PRESERVERS.**

*Report.*—The burial casket is commended for improvement in design and construction, whereby greater durability is secured; superior workmanship, and elegance of finish.

The burial robes are commended for excellence of design and finish and adaptability to use intended.

The corpse preserver is commended for good design and superior adaptability for purpose intended.

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**298. W. M. Smith, West Meriden, Conn., U. S.****CASKET TRIMMINGS.**

*Report.*—Commended for good designs, finish, and workmanship.

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**299. Reed & Barton, Taunton, Mass., U. S.****CASKET TRIMMINGS.**

*Report.*—Commended for good design, fine workmanship, and ornamental finish.

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**300. C. Rogers & Brothers, West Meriden, Conn., U. S.****CASKET AND COFFIN TRIMMINGS.**

*Report.*—Commended for extensive variety, good quality, and finish.

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**301. Eldridge J. Smith, Philadelphia, Pa., U. S.****BILL-HOLDER.**

*Report.*—Commended for its practicability and usefulness.

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**302. Jennings Brothers, Southport, Conn., U. S.****PAILS, BASINS, BOWLS, AND MILK PANS.**

*Report.*—Commended for lightness, durability, and cheapness.

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**303. Fowler Fly Fan Co., Philadelphia, Pa., U. S.****FLY FAN.**

*Report.*—Commended for originality and usefulness.

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**304. Richmond, Backus, & Co., Detroit, Mich., U. S.****RAILROAD TICKET CASE.**

*Report.*—Commended as practical in design and compact in arrangement for the purposes intended.

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**305. E. Paz, Paris, France.****GYMNASTIC APPARATUS.**

*Report.*—Commended for compactness of construction and general adaptability for the purposes intended.

## 306. Duplan, Hamot, &amp; Co., Paris, France.

## TAPESTRY.

*Report.*—A magnificent display of tapestry made by hand, admirably executed, beautiful in effect, exceedingly artistic, and practical in its uses.

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## 307. F. A. Clarberg, Stockholm, Sweden.

## JEWELRY CASE.

*Report.*—Commended for good workmanship displayed in a jewelry case; well suited to purpose intended.

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## 308. Carl Lürssen, Delmenhorst, near Bremen, Germany.

## CORKS.

*Report.*—Commended for perfection in quality and form.

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## 309. Carl Lindemann, Dresden, Germany.

## CORKS.

*Report.*—Commended for fine stock and perfect workmanship.

## SIGNING JUDGES OF GROUP VII.

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The figures annexed to the names of the Judges indicate the reports written by them respectively.

ROBERT MITCHELL, 1, 3, 4, 6, 7, 8, 20, 21, 22, 23, 26, 35, 75, 76, 167, 170, 183.

ADDISON BOYDEN, 2, 5, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 25, 27, 28, 29, 30, 31, 32, 33, 34, 51, 52, 54, 55, 56, 57, 58, 59, 60, 61, 63, 64, 65, 67, 69, 70, 71, 72, 73, 74, 77, 79, 81, 82, 86, 91, 96, 98, 99, 100, 102, 104, 105, 106, 107, 109, 110, 129, 139, 154, 155, 156, 157, 159, 166, 168, 169, 171, 172, 173, 176, 177, 179, 180, 184, 188, 197, 199, 201, 204, 205, 206, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 219, 221, 222, 225, 228, 230, 231, 232, 236, 237, 238, 239, 241, 255, 258, 263, 265, 266, 268, 269, 288, 289, 290, 292, 296, 301, 304, 308, 309.

CHAUNCEY WILTSE, 36, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 66, 178, 186, 200, 218, 264, 302.

THEODORE SNYERS FILS, 37, 62, 68, 78, 80, 83, 84, 85, 87, 90, 92, 93, 94, 95, 97, 101, 103, 108, 111, 127, 131, 132, 133, 135, 138, 140, 141, 142, 143, 144, 146, 147, 148, 153, 158, 160, 161, 162, 163, 164, 165, 174, 175, 181, 185, 187, 189, 193, 195, 198, 202, 223, 224, 226, 227, 233, 234, 235, 240, 249, 250, 252, 253, 254, 256, 257, 261, 267, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 291, 293, 295, 297, 298, 303, 305, 307.

FRANCIS THONET, 53, 88, 89, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 128, 130, 134, 136, 137, 145, 149, 150, 151, 152, 182, 190, 191, 192, 194, 196, 203, 207, 220, 229, 242, 243, 244, 245, 246, 247, 248, 251, 259, 260, 262, 294, 299, 300, 306.

# SUPPLEMENT TO GROUP VII.

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## REPORTS OF JUDGES ON APPEALS.

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### JUDGES.

JOHN FRITZ, Bethlehem, Pa.  
EDWARD CONLEY, Cincinnati, Ohio.  
CHARLES STAPLES, JR., Portland, Me.  
BENJ. F. BRITTON, New York City.  
H. H. SMITH, Philadelphia, Pa.

COLEMAN SELLERS, Philadelphia, Pa.  
JAMES L. CLAGHORN, Philadelphia, Pa.  
HENRY K. OLIVER, Salem, Mass.  
M. WILKINS, Harrisburg, Oregon.  
S. F. BAIRD, Washington, D. C.

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#### 1. Mrs. S. Short, Cincinnati, Ohio, U. S.

BLANKET WASHER, MANGLE, AND IRONER, AND STRETCHER FOR DRYING CURTAINS.

*Report.*—Washer and ironer, also mangle; commended as well made and well fitted to accomplish their intended purposes.

Curtain-drying frame; commended as simple and effective.

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#### 2. I. Newton Peirce, Philadelphia, Pa., U. S.

REVERSIBLE SETTEE.

*Report.*—Commended for simplicity and durability.

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#### 3. The Adjustable Writing and Reading Desk Manufacturing Co., Rochester, Minn., U. S.

ADJUSTABLE WRITING AND READING DESK.

*Report.*—Commended for utility, portability, and ease of application to any ordinary chair.

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#### 4. Sawyer & Buckley, Meriden, Conn., U. S.

REVERSIBLE CHECKER-BOARD TABLES.

*Report.*—Commended for convenience and good workmanship.

These tables have a reversible top with arrangements for different games on opposite sides: thus, one side may be for backgammon and the other for chess; and with boxes arranged to hold the articles needed for each game.

## 5. O. E. Miles, Oskaloosa, Iowa, U. S.

## COMPOSITE WOOD CENTRE TABLE.

*Report.*—Commended for beauty of design and good workmanship.

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## 6. Irving D. Clark, Gloversville, N. Y., U. S.

## SELF-ROCKING CRADLE.

*Report.*—Commended for utility, convenience, and fitness for the purpose intended.

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## 7. G. Gunther, New York, N. Y., U. S.

## BIRD-CAGES.

*Report.*—Commended for good workmanship, variety, and fitness for the purpose intended

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## 8. The Keystone School and Church Furniture Co., Philadelphia, Pa., U. S.

## SCHOOL AND CHURCH FURNITURE.

*Report.*—Combined desk and seat; commended for good form for comfort, good make, and ingenuity.

Reversible settee; commended for ease in reversing and economy of space, as it occupies the same space or location on the floor when turned in either direction.

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## 9. E. M. Thurston, Providence, R. I., U. S.

## SCHOOL FURNITURE.

*Report.*—Commended for simplicity, good workmanship, and fitness for its intended use.

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## 10. Frederick Sage, London, England.

## AIR-TIGHT SHOW-CASE AND VELVET SHOW-STANDS FOR JEWELERS' WINDOWS.

*Report.*—Commended for good workmanship and design.

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## 11. Edward Matthews &amp; Son, London, England.

## MEMORIAL BRASSES, STAINED GLASS WINDOW, AND DECORATIVE TILES.

*Report.*—Commended as an interesting and beautiful display of hand-painted tiles and mural brasses of fine workmanship and good design.

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## 12. James McEwan, Melbourne, Victoria, Australia.

## SIDEBOARD.

*Report.*—Commended for good design and excellent workmanship.

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## 13. C. M. Carey, Queensland, Australia.

## WORK-BOX OF CURIOUS WOODS.

*Report.*—Commended for very good workmanship.

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## 14. Alcock &amp; Co., Melbourne, Victoria, Australia.

## BILLIARD TABLE.

*Report.*—Commended for good workmanship.



## REPORTS ON AWARDS.

## 15. Luigi Martinotti, Turin, Italy.

INLAID CABINET.

*Report.*—Commended for good design and workmanship.

## 16. Luigi Elli, Milan, Italy.

THEATRE CHAIRS.

*Report.*—Commended for convenience, comfort, and good workmanship.

## 17. Louis Gutte, Görlitz, Germany.

CARVED CABINET AND FURNITURE OF DEERS' HORNS.

*Report.*—Commended for good workmanship and tasteful designs.

## SIGNING JUDGES OF SUPPLEMENT TO GROUP VII.

The figures annexed to the names of the Judges indicate the reports written by them respectively.

COLEMAN SELLERS, 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17.

B. F. BRITTON, 6.

H. K. OLIVER, 7.







1872

1873

1874

1875

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~~DUE AUG 15 '91~~

SALE  
BOOK DUE  
JUL 11 1991  
JAN 28 1991

WIDENER  
CANCELLED  
FEB 19 1992  
MAR - 2 1992  
BOOK DUE

